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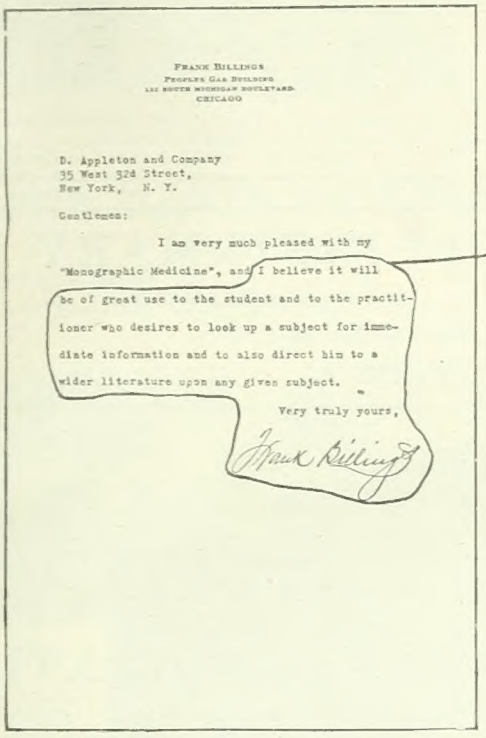

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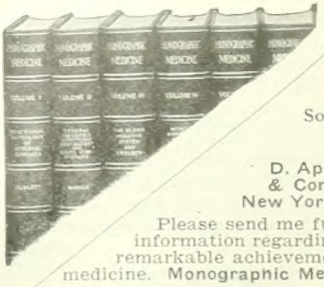

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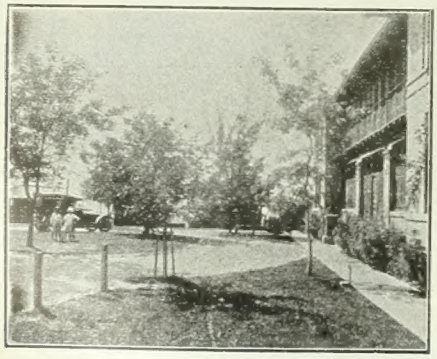

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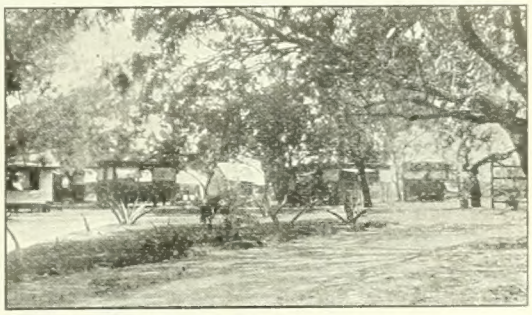

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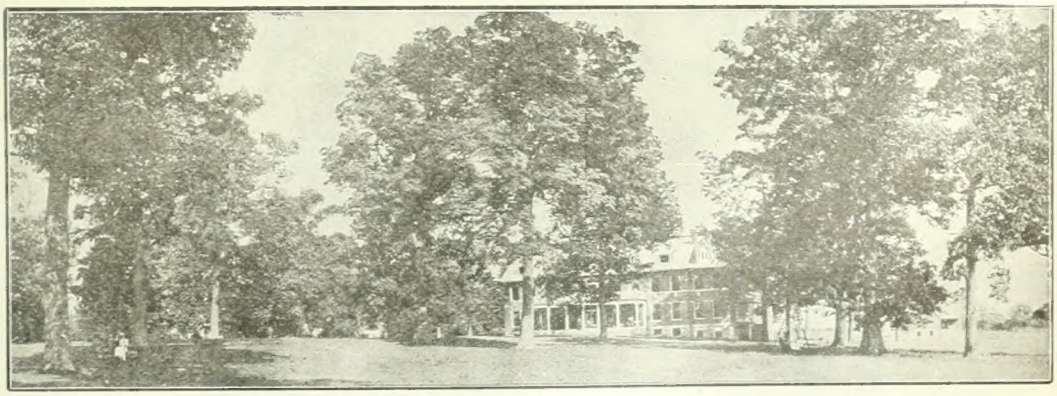

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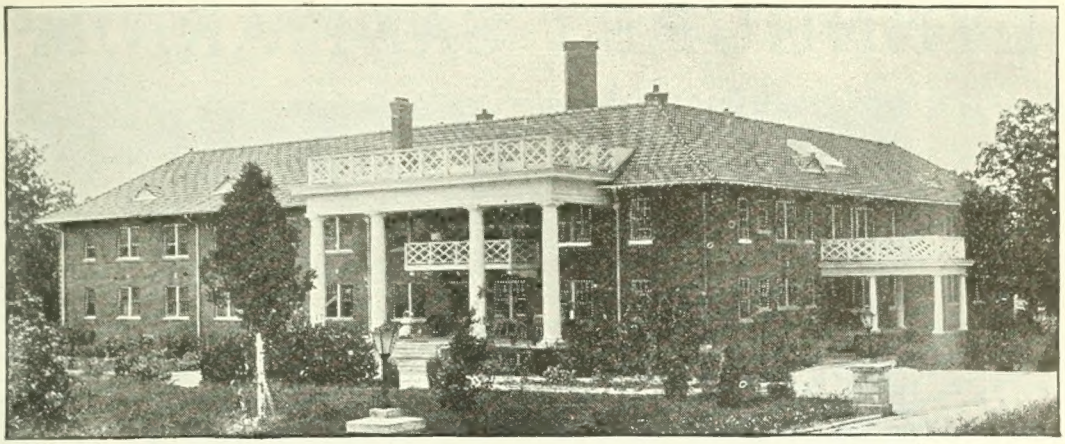

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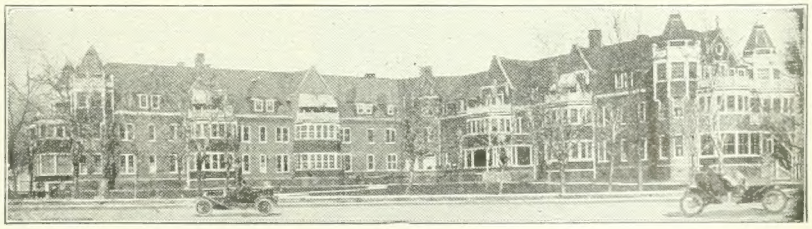

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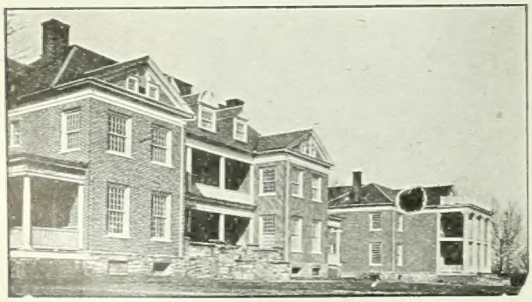

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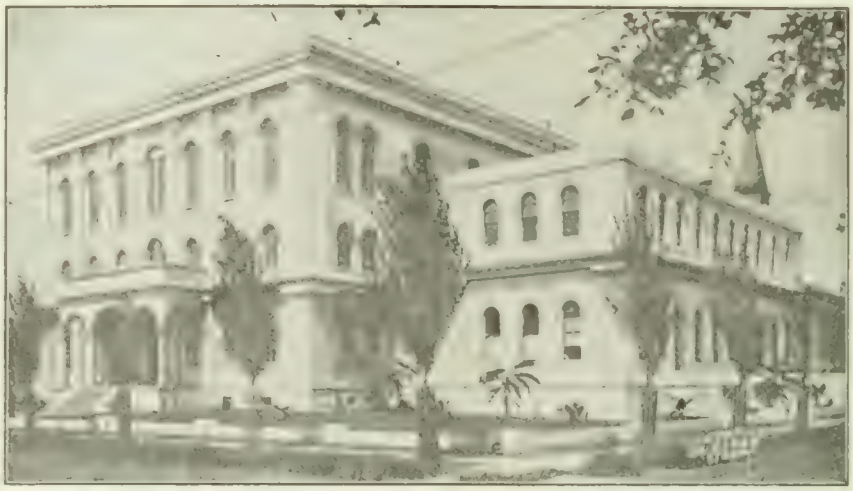

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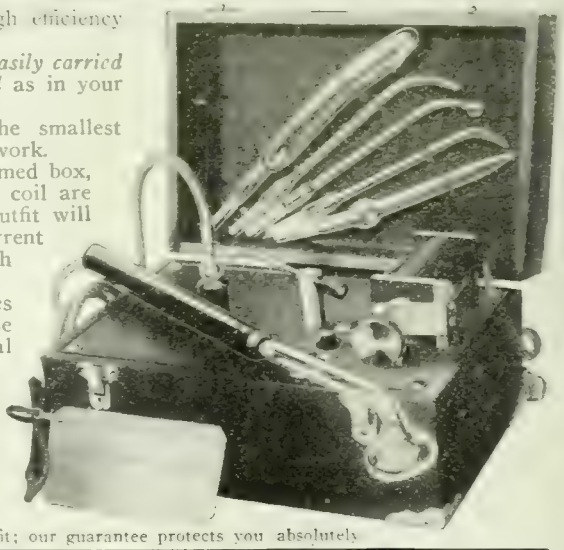

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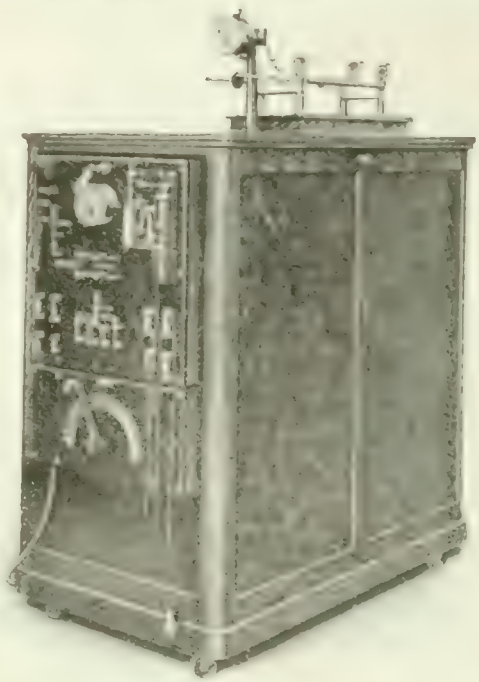

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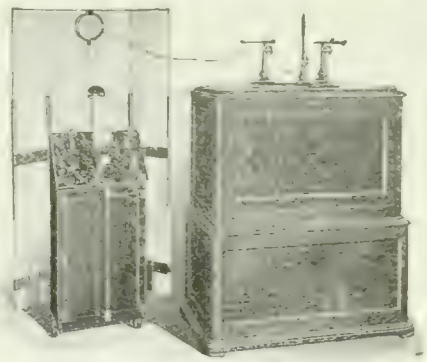

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(INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.)

SOME PROBLEMS IN THE ETIOLOGY OF POLIOMYELITIS*

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Notwithstanding the exhaustive study that has been devoted to the subject, there remains an element of apparent mystery in the spread of poliomyelitis. To be sure, experimental researches have yielded evidence which appears fairly complete in comparison with that regarding several other more common infectious diseases; and epidemiologic observations, though limited in extent, have been made and studied with unusual care. The seeming mystery of the disease lies, however, in the fact that the observations from these two angles, laboratory and field, do not appear to blend into any simple and obvious conception. On the one hand, the experimental evidence indicates that the disease is exclusively a human infection directly transmitted from person to person; on the other hand, extensive epidemiologic observations are consistent in their testimony that definite lines of contact between cases can seldom be traced, and that the disease shows other features which we are not accustomed to expect in a directly transmitted infection.

It can not be doubted that when all the facts shall have been collected and properly co-ordinated, they will point to a single, definite and logical conclusion; but as yet we can not be certain that all the essential facts have been discovered, or that those known have been given the proper relative importance. Therefore, conclusions must still be tentative, and, accordingly, in the discussion here presented, no attempt is made to establish a final conclusion, but only to present the evidence which forms the basis of the opinion at present most commonly accepted, and which seems most in harmony with the known facts, namely, that poliomyelitis is transmitted from person to person by mechanical transference of infectious secretions.

In order to give a broader basis for the discussion of experimental and epidemiologic data, it may be well to begin by digressing to note two remarkable features of this disease,—its progressive increase in epidemic prevalence and an apparent change in its clinical manifestations within the brief period of two score years.

INCREASE IN PREVALENCE

As is well known, poliomyelitis is not a new disease, having been recognized and described by Jacob von Heine, in 1840, and having undoubtedly prevailed to some extent long before that time, as shown by numerous references. As described by the observers of previous generations, however, it was a rare, sporadic disease, occurring here and there in isolated cases so scattered as to give hardly a suggestion of transmissibility. It was not until about 1880 that Von Bergenholz, in Sweden, first observed and clearly described a small epidemic of some twenty cases.

*Read in Section on Medicine, Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916.

From this date forward for the next twenty-five years epidemics were reported from time to time in various parts of the world; but these outbreaks were invariably small, and, so far as we know, localized, seldom, if ever, extending beyond the confines of a single city or county.

The first widespread epidemic recorded occurred in Norway and Sweden during the summer of 1905, totaling about 1,500 cases, distributed quite widely over the Scandinavian Peninsula. This epidemic is a landmark in the history of poliomyelitis, marking the first instance of widespread epidemic prevalence and apparently the beginning of a great pandemic wave which has since extended to practically all parts of the world. The next large epidemic occurred in New York City in the summer of 1907, spreading to adjacent portions of New York State and into Massachusetts, reaching an estimated total of fully 2,500 cases. Following this, in 1908 and 1909, there were outbreaks of considerable size in various widely separated sections of the United States; and, in 1910, the disease reached a pandemic prevalence in this country, with extensive outbreaks totaling over 7,000 cases reported in various Northern states from coast to coast.

Since 1910 the occurrence of poliomyelitis has been recorded in morbidity and mortality reports in the United States, and these records indicate that we have had in this country not less than 2,000 to 5,000 cases yearly. It may also be noted that during this period, in 1911, Sweden suffered an epidemic of some 3,000 cases, far exceeding the previously unprecedented epidemic of 1905 in that country.

Finally the present year, 1916, has witnessed an epidemic originating in New York City, extending through a radius of some 200 to 300 miles, reaching the enormous and unprecedented proportions of approximately 20,000 cases.

It is impossible to give precise figures showing the increase in endemic and epidemic prevalence of poliomyelitis since 1880, because the disease has been included in official morbidity records in this country only since 1910, and in many other countries it is not reported even yet. However, even in the absence of precise figures, there can be no doubt as to the fact that there has been a progressive and enormous increase, especially in epidemic prevalence, during this period, as is strikingly shown by the increase in the size of epidemics.

The largest single epidemics reported up to the successive years cited have been as follows:

Up to and including 1885, about 25 cases.

Up to and including 1895, about 125 cases (Vermont, 1894).

Up to and including 1905, about 1,500 cases (Norway and Sweden).

Up to and including 1907, about 2,500 cases (New York City and vicinity).

Up to and including 1910, about 5,000 to 10,000 (Panademic, U. S.).

Up to and including 1911-12, about 3,000 cases (Sweden).

During 1916, about 20,000 cases (New York City and northeastern U. S.).

Thus, within a generation we have witnessed epidemics of this disease increase in size from a maximum of 20 up to 20,000 cases, and there is no evidence that the limit has yet been reached.

CHANGE IN CONCEPTION OF CLINICAL PICTURE

The second remarkable feature which demands our attention is the evolution in our conception of the clinical picture of this disease. As described by the older clinicians, poliomyelitis was distinguished almost solely by the sudden development of permanent flaccid paralysis of muscles supplied from the spinal segments, with no distinctive accompanying symptoms. Corresponding to this clinical picture the essential and primary lesion was considered to be a destruction of motor cells of the anterior cornua, a very natural conception considering that pathological studies were almost wholly confined to cases long past the acute stage.

In contrast to this conception is the one now well established and slowly receiving general recognition, that in poliomyelitis the essential and primary lesion of the nervous system is a perivascular and more or less diffuse round-celled infiltration of the leptomeninges, extending into the substance of the cord and medulla, most intense around the motor cells of the anterior cornua and the motor centres of the bulb, but by no means confined to these areas, extending even to the poste-

rior root ganglia. Associated with this are characteristic changes in the cerebrospinal fluid, rather constant though not distinctive changes in the blood picture, and more or less constant lesions in other organs, especially in the glandular appendages of the digestive tract.

Corresponding to this broader pathological picture, it is now recognized that we have paralysis of bulbar as well as of spinal origin, indeed that any motor centre whatsoever may be affected and that the motor function may be impaired to any extent, from complete and permanent paralysis to the most transitory paresis, or even, in some instances, a mere disturbance of reflexes. Preceding or accompanying paralysis we now recognize a fairly characteristic train of more or less severe symptoms, usually an acute febrile reaction, gastro-intestinal disturbances of greater or less severity; indications of meningeal irritation, and often sensory symptoms, probably attributable to inflammation of the posterior root ganglia. Finally, it is now thoroughly established, by clinical observation and special diagnostic measures, that poliomyelitis frequently occurs without paralysis, that it is indeed not necessarily a paralytic disease, but frequently occurs in so-called "abortive" forms without impairment of the motor function, sometimes presenting a distinctive clinical picture, at other times with symptoms so mild and indefinite that a diagnosis can be made only by association with frank cases or with the aid of lumbar puncture .

The picture of poliomyelitis as we now see it was first fully presented and emphasized in the year 1890 by Medin, based upon his observations in Sweden, completed and more firmly established by Wickman, from his experience in the Swedish epidemic of 1905. The special and perhaps the greatest clinical contribution of Wickman was the recognition of abortive types showing no paralysis. It is of course possible that this evolution in our conception of the clinical features of poliomyelitis may be due to more extended and closer observation of grouped cases in recent years. However, it seems highly improbable that the clinicians of past generations would have failed to note and describe the disease as we now see it had they observed it in such forms; more likely that its clinical manifestations have actually undergone a change.

So far as I am aware, we have no analogy among infectious diseases to the truly extraordinary development of poliomyelitis, the thousandfold increase in epidemic prevalence of a disease long endemic, and the corresponding apparent change in clinical type. Both these phenomena are so contrary to experience that they should at least prepare us to find, in the study of this disease, other extraordinary and unexpected features. Without attempting to interpret the significance of these developments, we may at least note as suggestive that the first clearly described epidemic outbreak was noted in Sweden, in 1880; that from Sweden the clinical types which have now become so common were first described; and that in Sweden the first widespread epidemic occurred in 1905. These facts lead us to consider at least the probability that the increase in prevalence and change in clinical type are closely related phenomena, and that both originated in the Scandinavian Peninsula.

EXPERIMENTAL STUDIES

To take up now a more specific discussion of the etiology of poliomyelitis, probably our most definite and concrete knowledge has been derived from experimental laboratory researches, which have established the following essential facts:

Poliomyelitis is a specific infection, due to a micro-organism, a so-called filterable virus.*

This virus is highly pathogenic for monkeys, producing in them characteristic symptoms and lesions essentially similar to those observed in man. It appears to be non-pathogenic for other animals, except rabbits, in which its effects are inconstant and the lesions not distinctive. The fact that monkeys alone have been found readily susceptible to experimental infection suggests that in nature the infection is highly specialized, confined to the human race.

*Recent researches have raised new questions as to the nature of this organism, and have suggested that certain streptococci may play an important role in infection, but the evidence so far brought forth is not sufficient for final judgment.

There seems to be no doubt that the specific organisms of poliomyelitis has been isolated and propagated on artificial culture media, but so far this achievement has proven chiefly of academic interest, since, even in pure culture, the organism is identified with certainty only by its effects when inoculated into monkeys.

The virus is found in various tissues of persons who have died of the infection, being present in greatest concentration in the nervous system, usually present also in the mesenteric glands and tonsils.

Of more direct significance from the standpoint of natural transmission, the virus has been demonstrated during life in the buccal, nasal and intestinal discharges of patients in the acute stage of the disease, persons convalescent from acute attacks, and apparently healthy persons who have been more or less intimately associated with cases of poliomyelitis.

Finally, there is the significant fact that monkeys have been experimentally infected by application of the virus to the nasal mucous membrane, and occasionally by feeding, under somewhat artificial conditions.

Certainly these facts, which have been repeatedly and thoroughly confirmed, constitute a very strong chain of evidence to support the view that poliomyelitis is directly transmissible from person to person; but, as has already been noted, certain epidemiologic characteristics seem at first thought to be inconsistent with this idea.

EPIDEMIOLOGIC CHARACTERISTICS

The salient epidemiologic features of poliomyelitis, so far as they may be summarized in a few words, and necessarily disregarding certain exceptions, are believed to be the following:

For many years the disease has occurred *sporadically* throughout the United States and Europe, probably throughout the world. Sporadic cases occur singly, in the most isolated rural communities as well as in congested cities, characteristically showing no traceable relation to previous cases. Their epidemiologic significance lies chiefly in the fact that they indicate the existence of a *concealed reservoir of infection*, practically world-wide in its distribution.

Within the last few decades *epidemic outbreaks* have occurred in almost all parts of the world. These epidemics, which have become progressively larger, have been most extensive in the northern sections of Europe and the United States, but they have not been confined exclusively to any special area.

In their *geographic distribution*, epidemics are *notably irregular*, sometimes spreading rapidly and quite uniformly from a definite focus, at other times remaining localized or skipping wide areas in close communication with such a focus.

Almost without exception poliomyelitis reaches its highest *prevalence*, both endemic and epidemic, *during the summer and autumn months*, declining markedly with the advent of winter. This seasonal distribution, which is one of the most constant characteristics of the disease, suggests by analogy either that it is transmitted by some insect prevalent chiefly during the summer and autumn, or that it is a gastro-intestinal infection. In this connection it may be noted that the rise and fall of epidemics is to a certain extent independent of season, certainly independent of considerable variations in weather conditions, since it is often noted that while an epidemic is on the decline in one focus it is just developing in some other near-by localities under approximately similar weather and seasonal conditions. Also it is noteworthy that cases occur, though rarely, through the winter months, thus showing that the disease is not so sharply limited in seasonal prevalence as are some diseases transmitted exclusively by insect carriers such as flies and mosquitoes.

Even in the most intense epidemics of poliomyelitis only *a small proportion, usually not more than one to five per thousand, of the total population* in the epidemic area is affected with recognizable symptoms of infection; yet the epidemics are invariably *self-limited*, declining rather sharply, often in mid-season, after only this small proportion of the population has been attacked.

Areas in which poliomyelitis has reached an epidemic prevalence characteristically remain more or less *immune* for a period of two to six years thereafter. Considering the relative rarity of epidemics of poliomyelitis, this feature is not ordinarily remarkable, but it has ap-

peared striking in several instances, notably in the relative distribution of the two Swedish epidemics of 1905 and 1911.

Another constant and remarkable feature of the disease is that its *incidence is confined largely,* though not exclusively, *to children in the first decade* of life, more especially to those under six years of age. This has been especially notable in epidemics affecting large cities in the United States, where 80 to 90 % of all cases have usually been in children under six years of age. The relative incidence of the disease in persons of different ages may be illustrated by some figures from the Buffalo epidemic of 1912.

Incidence of Poliomyelitis in Persons of Various Ages: Epidemic of 1912, *Buffalo, N. Y.*

Age Years	Total population of designated age	Cases of designated age	Per cent of total cases	Cases per 100,000 persons of designated age
Under 5	42,257	212	76	508
5 to 14	77,449	59	21	73
15 to 24	87,106	9	3	10
Over 24	216,903	0	0	0

In this epidemic, which is fairly typical of recent urban outbreaks, the whole population over twenty-four years of age, that is over half the population remained exempt, while more than 50 % of the cases were in children under five, constituting about 10 % of the total population. It is almost inconceivable that the children scattered widely throughout a city are so enormously more *exposed* to any kind of infection than are adults, so that there seems no adequate explanation for the disproportionate incidence among children, except that they are vastly *more susceptible* to the disease.

The most intensive study of numerous outbreaks has consistently *failed to show precisely the sources and routes of infection.* Water supplies, milk supplies and massive food infection have been satisfactorily excluded. Within a particular community the incidence shows no distinct relation to domestic environment, cases occurring in approximately equal ratio among families living under the best and those under the worst hygienic conditions. From a somewhat broader viewpoint, however, there is a characteristic relation to environment, namely, that epidemics consistently reach a higher prevalence in rural communities and small towns than in large cities.

Direct contact between patients can not be traced in the majority of cases. Ordinarily not more than 20 % of cases are found to have been in contact, either directly or indirectly, with previous known or suspected cases; while, on the other hand, a very considerable proportion of cases occur under conditions which absolutely preclude all probability of the patient's having been in recent contact with any previously recognized frank case of poliomyelitis, or even any case of febrile illness.

Bearing in mind these general epidemic features, if we are to conceive of poliomyelitis as a disease transmitted directly from person to person by mechanical transference of infectious secretions, as is indicated by the experimental evidence, we must accept certain inevitable collateral conclusions, namely:

First, that *the disease is spread chiefly from sources other than frank, recognized cases.* This must necessarily be so, since a large proportion, often a majority of cases, have certainly not been in contact with previous frank cases of poliomyelitis, either directly or indirectly, through distinctly traceable channels.

Second, that *a large proportion of the general population,* including practically all the adults, especially in the large cities, *is insusceptible to the disease,* or at least capable of resisting infection without exhibiting a definite clinical reaction. No other assumption appears satisfactorily to explain the facts that the disease is limited so almost exclusively to children, that a large proportion even of children intimately exposed to acute cases escape the disease; and finally, that epidemics characteristically decline spontaneously after only a small proportion of the children have been visibly affected.

These two points must therefore be granted if we are to conceive of poliomyelitis as a disease spread by contact. Indeed, it would appear that they must be granted to explain the incidence of the disease on any theory of transmission as yet advanced.

IMMUNITY TO POLIOMYELITIS

This raises the question as to why a large proportion of the general population, especially adults, are insusceptible to the infection of poliomyelitis. In the light of recent experience with the Schick test in diphtheria, we may readily believe that immunity to poliomyelitis may be congenital, that some children are naturally susceptible and others immune to this infection. It is also quite readily conceivable that with advancing age the body becomes normally more resistant to the effects of a virus which seems at most to be not uniformly pathogenic.

There are, however, a number of facts which strongly suggest that the general immunity of adults and of children after the first decade of life is acquired as the result of a previous infection with poliomyelitis in unrecognized form; in other words, that poliomyelitis is a disease of very general prevalence and that, like measles, it appears to be essentially a children's disease chiefly because the majority of adults have been immunized by a previous infection.

Following are the facts which suggest this idea. Individually they are not highly significant, but considered collectively, as links in a chain of evidence, they are at least extremely suggestive, though admittedly not conclusive.

1. As already noted, poliomyelitis is known to occur in all grades of severity, frequently without paralysis and with quite indefinite clinical manifestations. It is obvious that such cases, heretofore recognized only during epidemics, would ordinarily escape recognition and diagnosis.

2. Sporadic cases occurring from time to time, showing no traceable connection with other cases, indicate the existence of a permanent, concealed reservoir of wide distribution.

3. Epidemics, as already noted, are always self-limited, invariably declining after only a very small proportion, usually from one to five per thousand of the population, in the community has exhibited any clinical evidence of the disease. This spontaneous decline of epidemics is difficult to account for on any hypothesis other than that the susceptible population has been exhausted or greatly reduced.

4. Of the same significance is the fact that communities in which the disease has reached an epidemic prevalence characteristically remain immune for several years, even in the presence of subsequent epidemics in contiguous territory.

5. It is noteworthy that epidemics have characteristically reached a higher degree of prevalence in the population of rural communities and small towns than in large, densely populated cities. This is in accordance with the supposition that persons resident in large cities would be more generally exposed to immunizing infection early in life.

6. Perhaps the most significant of all established facts in this connection is that the age distribution of poliomyelitis cases in rural epidemics is different from that observed in epidemics occurring in large cities. It has previously been noted that in large metropolitan epidemics usually not more than 10 to 20 % of cases are over the age of five years, not more than 2 to 4 % over the age of ten, and ordinarily less than 1 % over the age of 20. On the other hand, in the distinctly rural outbreaks noted in Minnesota (1909), in Iowa (1910), and Sweden (1905), as high as 40 to 50 % of cases have been in persons over five years of age, 20 % in those over 10 years of age, and from 5 % to 10 % in adults. This difference in age distribution, illustrated in the following table, has been noted as a constant feature in all statistics available, and while the statistics are not so extensive as might be desired, they are believed to be sufficient to establish this general characteristic.

*Age Distribution of Poliomyelitis Cases in Urban and Rural Epidemics**

Percentage of Total Cases in Persons Over Designated Ages

Epidemics	Over 5 Years	Over 10 Years	Over 15 Years	Over 20 Years
New York City, 1907 (729 cases)	9.5	3.0	1.1	0.4
Cincinnati, Ohio, 1911 (97 cases)	7.2	1.0	0.0	...
Buffalo, N. Y., 1912 (274 cases)	18.6	4.1	2.9	0.7
Minnesota, rural, 1909	44.9	21.2	13.5	7.0
Iowa, rural, 1910 (348 cases)	47.4	25.7	15.0	7.5

*Data from Hyg. Bull. No. 90, U. S. P. H. S., Washington, 1913, p. 209.

These figures indicate a rather remarkable difference between rural and metropolitan populations with respect to immunity to poliomyelitis. If the infection were merely more intense in rural communities with no essential difference in the population immunity, we might expect a higher total incidence per thousand among adults, but we would hardly expect a difference in the ratio between adult and infant cases.

It is of interest in this connection that statistics compiled by the Pennsylvania State Department of Health*, showing the age distribution of rural and urban cases of scarlet fever, diphtheria and typhoid fever reported in that state for a number of years, show a similar though less striking difference, that is, a higher proportion of cases of those diseases among children under 10 in urban than in rural communities.

7. Finally, in support of the view presented is the fact, previously emphasized, that in recent years poliomyelitis has shown a remarkable increase in prevalence, along with an apparent change in clinical type, and that the new clinical type and the epidemic tendency both appear to have originated in Sweden. This would suggest that some decades ago there took place a more or less gradual exaltation in the virulence and pathogenicity of the infective agent, such that it became capable of causing in general a more acute reaction and thus producing recognizable symptoms in a larger proportion of cases. The increased epidemic prevalence throughout a large part of the world since that time might then be explained by assuming that this more highly pathogenic strain of virus has become more and more widely disseminated; that we have perhaps not a great many more cases of poliomyelitis infection now than in previous years, but have merely a higher proportion showing reactions which bring them above the border line of clinical recognition.

This idea of a widespread prevalence of poliomyelitis giving rise to a fairly general immunity was advanced some years ago, first by Wickman, and later by Wernstedt. The idea is advanced at this time not as a conclusion but merely a suggestion for further consideration and study. The ultimate answer to this and other questions in the etiology of poliomyelitis must await further developments. This particular problem might be readily solved by the development of some test, similar in its application to the Schick test, for specifically differentiating between immune and non-immune persons, or by some simple specific diagnostic test enabling the recognition of clinically indefinite cases of poliomyelitis.

In the meantime, pending the development of these hypothetical aids, it is to be hoped that the practitioners of the country will take advantage of their opportunities to assist in the solution of this problem. With the broader view, now well established, that poliomyelitis is not necessarily accompanied by paralysis, and that with close observation many cases may be diagnosed even in the absence of paralysis, physicians should be more on the alert for cases presenting suspicious symptoms, and in such cases should avail themselves of the diagnostic aid offered by lumbar puncture.

With more general diagnosis of such non-paralytic cases, and more complete morbidity reports, we may hope to collect a fund of evidence which will furnish the answer to the question that has been raised. For example, it now appears, from very imperfect morbidity statistics, that the endemic prevalence of poliomyelitis shows cycles of decrease and increase similar to those shown by measles, also that the epidemic prevalence in various sections of the United States has been roughly in inverse ratio to the previous endemic prevalence, facts which, if thoroughly established, would obviously be of the utmost significance.

*Annual Reports of the Commissioner of Health, State of Pennsylvania, years 1907-1912. Subdivision of Morbidity Statistics.

SIMPLIFIED INFANT FEEDING*

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1. The last few years have developed

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nothing of a startling character in the artificial feeding of infants. However, there has been a general effort toward the simplification of the many methods. The inability or the unwillingness of some mothers to nurse the child necessitates the use of artificial food. The best food is the natural food, and in the use of artificial food, particularly during the first few months of life, we are confronted with many difficulties. Many articles upon the subject of artificial feeding leave the impression that the method is simple and the results brilliant. Actual experience will convince us of its fallacy, for no child should be deprived of breast milk until every means of adjusting it to the digestive ability of the baby has been exhausted. The results are at times surprisingly good and again are disappointing. In the instance of failure it becomes necessary to allow supplemental or complemental feedings. The former is more often advisable.

2. Human milk in the smallest amounts is helpful to the child for digestion and nutrition, and hence the advisability of utilizing all that may be had when the time comes to resort to artificial feeding. It is generally accepted that nothing so stimulates the production of milk as putting the child to the breast at regular intervals. It may be well to nurse one breast at a time or even both, and then allow a bottle feeding to follow the breast feeding once or twice during the twenty-four hours, if the child is not satisfied. It should be remembered that completely emptied breasts secrete better than when partially emptied, but there may be times when it is best to nurse one at a time and follow this with the bottle. The mere promise of lightening the burden of a nursing mother by the addition of mixed feeding for the child seems at times to improve her milk supply. As the breast milk diminishes or disappears the substitute feeding is to be increased in quality or quantity or in both, in order that nutrition and growth will not suffer.

3. Little distinction is often made in the type of infant under discussion in regard to artificial feeding. The age, nutrition, development, weight and digestive history must be accurately known if we are to appreciate and profit by what we read or what we hear. There is a wide difference in the feeding of an infant of average weight and good digestion and of one who has suffered from some inherent weakness, or who may have been the victim of a food injury and who subsequently is an easy victim any time his limit of tolerance for food is overstuffed. This is but another way of saying that all babies can not be fed alike. It should also be said that even all average babies can not be fed by any given method, though a good percentage can be when certain general principles are followed.

4. Much has been said about the injuries produced by sugar, fat and salts of cows' milk, and the protein held blameless. Part of this is no doubt true; yet it has been the cause of many cases of underfeeding with consequent failure to gain in weight and even to produce a weakened digestion through the fear of making trouble by increasing in necessary amounts the elements required in the total twenty-four-hour quantity. In our effort to prevent overfeeding we unfortunately do considerable underfeeding. The fact that fat is a trouble-maker for some children is no reason for depriving others of this valuable element. This applies with equal force to sugars.

5. It is essential that we have a good milk supply and this means a low bacterial count with approximately 4 % each of fat, sugar and protein. The milk is to be cooled rapidly and kept at a temperature below 50° and when possible below 45° F. This means that milk on delivery must be placed against the ice in a refrigerator and not allowed to grace the doorsteps or the porch for a variable length of time. All utensils should be clean. This milk contains the elements necessary for nutrition, but not in the same percentages as in human milk. We can imitate human milk in the preparation of the infants' food, but cows' milk, no matter how modified, will never be anything but cows' milk. It differs chiefly in its form of protein, and this tends to form tough curds when coming in contact with the gastric secretion in contrast with the flocculent curds of breast milk. The fat globules are larger, more irregular in shape, and have a capsule which fractures more easily, perhaps the cause of the gastric disturbance from cows' milk. Further, it has been shown

that cows' milk stays in the stomach longer than human milk.

6. The method of feeding in this country may be said to be comprised of those who use top milk mixtures and others who resort to the dilutions of plain milk with water or cereal diluents. Both add sugar to bring the amount up to 5, 6 or even 7 %. The sugars in use are lactose, saccharose and maltose, each of which has its advocates, though lactose and maltose are more generally used. Maltose is considered to be more rapidly absorbed and weight gains are attributed in part to its production of water retention. Lactose is preferred by some because it is the form occurring in breast milk and on account of its favoring the development of the predominant organism of the intestinal tract. I employ all three at different times and occasionally use lactose and maltose combined. Cane sugar is used more cautiously and never in the presence of an intestinal disturbance.

7. For the last ten years it has been my practice to use dilutions of whole or even partially skimmed milk in most of the average feeding cases. A few have been fed on top milk mixtures and whey and cream mixtures. The milk used in the latter has oftenest been that from the upper half of the quart bottle or the upper twenty ounces, adding the required amount of sugar and water in such amount as necessary to bring the mixture to meet the demand for the twenty-four feedings. When compelled by circumstances we have resorted to some of the proprietary foods, but always with an apology and a drop in our personal esteem. In every instance where this was done it was with a full knowledge of the food as obtained in the analysis, realizing its shortcomings and using it no longer than was necessary. In the matter of the milk mixtures the percentage of each constituent was figured and this often checked by the caloric value of the food. It is our belief that children who can handle foods in which the fat is greater than the contained protein, do best. This is particularly true of the first few months. However, the number who are able to handle fats for any length of time are in the minority. The fat is never used in excess of 4 % and is kept below that point for the greater part of the first year, and at times much later. High sugar mixtures plus high fats are often disastrous.

8. Alkalies are used only when indicated for the effect on gastric digestion. Those used are sodium bicarbonate, lime water and sodium citrate. Cereal diluents are used for their mechanical effect upon the protein and are used sparingly in the first few months. The reason for our infrequent use of alkalies and cereal dilutions may be attributed to the fact that we employ a great deal of cows' milk boiled from one to five minutes, and which we believe accounts for the infrequency of casein curds. This may be said to be almost the rule in the Summer months and with the approach of Fall we diminish the boiling time and return to raw milk in part and sometimes altogether. We have noted no ill effects from the use of boiled milk unless combined with an excessive amount of carbohydrate. Constipation is more often encountered than when raw milk is used. This is probably due to the absence of milk masses which so often produce an increased peristalsis where unboiled milk is used. It is a very happy state of affairs during the Summer months and we should like to see it more frequently.

9. Scurvy may develop, but is easy of recognition and control. It can be avoided by the use of either fruit juice or small amounts of potato, but there are some children who are intolerant of one or the other and this feature might prevent us in certain instances from taking the step that would most certainly prevent its occurrence. Some cases have done well on buttermilk when it was given on account of the failure of sweet milk or when afraid of the handling given milk by the caretakers. This was used in dilutions much the same as whole milk. As has been intimated, it is impossible to state what line of procedure is best until the digestive powers have been tried out by a mixture which experience indicates is the correct one.

10. It is known that the average child requires the protein contained in one and a half ounces of milk for each pound of its weight, but it will often take one or two ounces more of food than it is months of age. This holds true up to about eight months. For example, a child weighing 12 pounds at four months will require in 24 hours—12 times 1½ ounces, or 18

ounces of milk. The number of feedings may be placed at 7 in 24 hours and the feeding interval at 3 hours, feeding at 6 A. M., 9, 12, 3, 6, 9 and 2 A. M. Water has been added to make the total quantity 35 ounces; and this gives 5 ounces at each feeding. This amount of milk is insufficient for both nutrition and growth and must be increased by substituting milk for water in a quantity varying between ½ to 1 ounce every day or so until the milk equals 24 ounces or about 2 ounces for each pound of weight. A good many children will require more than this. Sugar is added in a few days, beginning with ½ level tablespoon and increasing to a point of tolerance, our aim being to get it to about three level tablespoons of maltose or lactose, or not more than two level tablespoons of cane sugar. The fat and protein in the beginning are about 2 % in the mixture and when 24 ounces are reached they are brought to approximately 2.70 %.

11. The requirement for the weight is about 45 calories per pound. We shall figure it as 45 times 12, or 540 calories. Our food as prepared equals 480 calories, giving whole milk a caloric value of 20 to the ounce. The addition of the sugar will bring this to 600. This must not be taken as evidence that the feeding is based upon caloric standards, for it is fat, sugar and protein, and not calories that the baby is asked to digest. We must follow the baby and increase the food strength of handling, provided there is good digestion and no gain or an unsatisfactory gain in weight. This is to be done even though the caloric requirement is exceeded. The estimation of calories is a check. It will help in the avoidance of both underfeeding and overfeeding. It is of real value here. Some infants seem to utilize every particle of food given them and these are the ones that give us the best results and therefore the least concern. We have felt that it is best to boil the milk in the beginning of most feeding cases. The length of time varies between one and five minutes. This seems to work better when high protein is used as is the case when dilutions are used. The protein can be increased in high fat mixtures by the addition of skimmed milk.

12. Feeding intervals are rarely longer than 3 to 3½ hours and only exceptionally less than 2½ hours. Fat children and those whose gastric motility seems sluggish are those who are asked to go 4 hours between feedings. In this we must be governed by the weight, age, appetite and digestive powers of the case under consideration. A thorough knowledge of the gross appearance of stools is essential to successful feeding and the microscopic examination is used too infrequently as a rule. The reaction of the stools to litmus is of some value, though the odor is as often sufficient to give us this information. We would stress the importance of seeing these cases at regular intervals, keeping in touch with their progress as to weight and advise against the too frequent changing of formulas except in the presence of a definite indication.

DISCUSSION

Dr. L. T. Royster, Norfolk, Va.—It seems to me the expression used in the doctor's paper, "Simplifying Infant Feeding," is a very important one; but in what does simplifying infant feeding consist? I would like to draw attention to one or two very small points, but ones that have helped me most in my personal experience. The first of these is, although we have been taught at various times and by sundry writers to use protein first, next fat, then sugar, and salts, each one individually and separately caused all the trouble in infant feeding. The pendulum is swinging widely from time to time with each separate utterance and we realize today each and all elements may be the cause of upsetting the digestion regardless of how the infant is fed. When the digestion is overtaxed by any one element, the digestive power is necessarily overtaxed for all elements.

The lesson to be taught is, we must understand two things in order to feed a child intelligently. The first of these is a knowledge of the chemistry of cows' milk, and I am referring to cows' milk particularly because I have never used a proprietary food or condensed milk in my life. The next thing is, we must understand the chemistry of digestion, and without a knowledge of the chemistry of what we are putting into the digestive tract plus the knowledge of what happens when it gets there, we can not feed a child so intelligently.

I wish to discuss the subject briefly from two points of view. The first is the point of view of the child who from whatever cause is suddenly or gradually weaned from the mother's breast. Not going into the whys and wherefores, let us take a child up to seven days or two months who stays on its mother's breast and then goes on artificial feeding. In a considerably large consultation practice, the error I see made most frequently is commencing with too strong a dilution of cows' milk, and that comes about from the fact that the average physician reads some standard text-book and works out a formula for the age of the child and the time it is weaning, never

realizing that very few babies can pass suddenly from mother's milk to the cows' milk formula at the age intended for the average child without an upset. Many text-books do harm in not emphasizing the fact that the formula worked out and suggested for a baby at that age is based upon the average of thousands of cases, and it takes thousands of children to make up the average.

The second thing is the child who becomes suddenly or gradually upset in its digestion, and what upsets the digestion is a sudden change, incapability on the part of the child to take care of the food gradually. It is getting too much of one or more elements. That is all indigestion means. It may mean a lowered capability in taking care of the food elements. It means that an unbalance has been struck. What do we do in that case? Here is the crux of the situation of infant feeding: always begin with a dilution so low that you know it can not hurt and work up gradually to enable the baby to acquire a tolerance for these food elements. The same principle exists exactly in infant feeding. A child can undoubtedly take more fat in the presence of malt sugar than in the presence of other sugars.

Dr. W. A. Mulherin, Augusta, Ga.—The subject of infant feeding is a broad one and we all know is the most important subject in pediatrics. We welcome any method that will simplify it, for it has truly been kaleidoscopic in its changes for the last several years.

Dr. Varden's paper does simplify it. It is modern in its ideas and conforms to the basic principles that must underly all sensible artificial feeding of infants. That principle briefly enumerated is, first, a recognition that good mother's milk is ideal and intended by nature for the baby. No artificial feeding is so good and must only be resorted to from necessity and not by election. Second, any substitute feeding must contain all the ingredients that mothers' milk contains,—that is, fats, carbohydrates, proteins, salts and water. Third, it must contain them in sufficient quantity to generate enough heat to maintain life, to repair the natural waste of the body and to promote natural growth.

We have been following Dr. Varden's idea at the Medical Department of the University of Georgia, and not only like its simplicity but find it works well. We, in addition to his excellent plan, figure the quantity of the mixture, in early months of life, as one-fifth the body weight, the amount of water required by the baby in twenty-four hours. To elucidate this let us say a baby weighs ten pounds. We know that one-fifth of sixteen ounces, which represents one pound, is approximately three ounces, therefore for each pound the baby weighs we give three ounces in the mixture. Three times ten will equal thirty ounces to be given the baby in its total mixture for twenty-four hours.

Again following the ideas of Dr. Varden, we give one and a half ounces of whole cows' milk for each pound the baby weighs and make up the required amount of calories the baby needs in twenty-four hours by adding enough sugar of milk or dextri-maltose to cover it.

It is well to remember that Huebner and Ruebner's scale of calories, which approximately is forty-five calories per pound weight in twenty-four hours, in the early months of life is not absolute. It must be used only as a general measure or as a target at which to shoot. Its chief value, therefore, lies in the information it gives, that is, in knowing whether we are overfeeding or underfeeding.

Having reached this vantage point of knowing that the composition of our formula conforms to the best recognized general rules on feeding, it is very important that we next study the peculiarities and individualities of the digestive organs of that particular body, remembering that each baby is a study unto itself and the food must be varied at times and adapted to its digestive capacity.

I am in thorough accord with Dr. Royster in stressing the importance of beginning with a weak formula and leading up to one on which the baby will thrive. It is a good rule, I believe, to start with one ounce of cows' milk per pound weight and lead up to one and a half per pound weight.

I can not refrain from expressing my agreement with Dr. Varden on the question of boiling milk. I do so, however, fearfully and reluctantly when I look across the hall and see Dr. Adams, of Washington, D. C., for I must confess I expect a "call-down" from him.

I had the honor of being a guest of the American Pediatric Society last year, and I heard Dr. Adams very ably and most vigorously condemn the boiling of milk. In spite of this, however, I advise the boiling of milk during the months of April to October, inclusive, especially in our warm Southern climate, for I fear the pathogenic organisms and the numerous other ones found in milk during the Summer months much more than the possible scurvy. Especially, I might add, since we have learned that we can give orange juice, which is a specific for scurvy, as early as one month of age.

Dr. Isaac W. Faison, Charlotte, N. C.—I have been exceedingly pleased with the paper of Dr. Varden. He has covered the ground remarkably well, and I am not going to say much outside of commending the paper generally.

I agree entirely with the wording of Dr. Mulherin that we should boil the milk. In Chicago they do not have the infective troubles with babies where they used boiled milk that we have, and they boil it or not in a cold country like that.

Outside of the caloric value, and outside of the proportion of milk in sugar, I find that it is necessary to look at the baby's weight at least once a week. The man who is observant knows what is going on, while the man who is not observant can not treat a child intelligently. With the feeding going on, if the scales show that the child is gaining one-quarter or one-half pound every week, is happy, sleeps well, has one or two bowel movements a day, your food is as good as you can make it possibly, and you had better look out how you change it. If it is not doing these things, then you have got to make a change.

As far as sugar is concerned, I can not agree with all that has been said. I have tried all sugars, and I must confess that my results with the sugars have been as good with one as with the other. I have used more cane sugar this year than ever before and my results have been as good as any other year. The growth of the child has been good, and the danger with the

boiled milk is the production of scurvy. But the antidote for scurvy is fruit juices, including apple juice. I do not care how small a child is, some of these fruits must be added if you boil the milk where the infant has taken them from the day it was born. We ought not by preference to take a baby from the breast in the beginning, but there are conditions laid down showing it would not do to nurse a child under these circumstances, and then we have to commence to feed, and I begin with them when they are twenty-four hours old with cows' milk diluted, not with sugar in the beginning, but as soon as the child will take as much as three ounces of cows' milk in a twenty-ounce mixture, two ounces every two hours, digest that, and maintain its strength the first ten days; then you can begin to put in sugar and increase its weight one-half to one-quarter pound in a week. If you overdo these things you are going to have a long time of waiting and watching and hoping it will stop so that you can start again. With eruption, with scalding, with the odor of the bowel movements, you can tell whether you have too much sugar or too much putrefaction. There are a great many things along that line we can do without the aid of the laboratory. The observant practitioner will see these things, and it is he who makes a good doctor for children.

Dr. Oliver W. Hill, Knoxville, Tenn.—The feeding of infants is one of the most important branches of medicine. In the last few years we have been able by simplifying the methods of infant feeding, to reduce the infant mortality very materially, and from what I heard of Dr. Varden's paper I should say it was excellent.

Dr. Royster does not know what he has missed by not using proprietary foods. As a rule, I feed these children no modified cows' milk, particularly the ones I am obliged to take from the mother, and sometimes I resort to artificial feeding, using such as condensed milk, and a number of things, and I am delighted to have them, and I must say that considering the number of times I have fed babies, I could not have fed them otherwise.

As to infant feeding, in doing quite a little consultation work my observation is that the recent general practitioner does not know how to feed babies. He is careless. You would be surprised to see some of the formulas of cows' milk. They say take a pint of milk, or half a pint, add two or three teaspoonsfuls of lime water to it, and give it every once in a while, instead of taking time to work out the proper formula. One does not have to work out the caloric value of the proteins and sugars. It is not important to do that unless he is a bad feeder. My caloric value of food does not worry me. If a child shows a constant gain, if the stools are normal, the formula is practically all right. After all, it is a matter of individuality on the part of the pediatrician and the child. Some children take enormous amounts of fat and get along on it, but a child fed on pure Jersey milk should give no trouble. Take another child, you would be surprised to see how it gets along with what we might consider a bad formula. Some doctors have wonderful results with high and low sugars, some with lactose, and some with malt sugar. Of the two, I like malt sugar the better. It seems to me what one man can do with feeding like that another is not able to do.

Another thing about boiling milk. I invariably pasteurize the milk or have the mother do it at home with a pasteurizing apparatus, if she has one, showing her how to do it.

I wish to urge on the general practitioner the need of paying more attention to milk modification, to take a little more time with formulas and study out what the child needs and whether or not the child can tolerate what you give. Start with a low percentage of all ingredients and raise them. You can tell by the stool if any one ingredient disagrees with the child. If it does, you can cut down the fats or proteids by your dilutions. It is simple to work out in practice. Of course, the ideal way is to have laboratory methods. Some of us try to use laboratory methods, but the doctor must examine the stools microscopically to determine whether there is any disagreement with that or this ingredient. If the child is gaining constantly, is happy, it is a good index that the feeding is all right.

Dr. Robert B. James, Danville, Va.—Why does the doctor boil the milk? You kill the germs when you boil the milk. There are some healthful germs as well as pathogenic organisms. We kill the lactic acid bacillus by boiling the milk. We get scurvy from lack of acid. But Dr. Faison said give the child fruit juices or fruit. You can not give an infant fruit, but you can give lactic acid or acetic acid. The trouble with lactic acid is we do not know whether we have it or not. We do know when we have acetic acid, or the acid of lemonade. That is why boiling causes scurvy; it kills the acid bacillus, and if we give acid that way we get rid of the scurvy.

Dr. Gaston J. Greil, Montgomery, Ala.—I am constrained to say that the subject of simplifying infant feeding, that is, detailed simplified infant feeding, has done a great deal of harm, inasmuch as it has made a great many people think that infant feeding is simply a matter of what Dr. Hill has said, namely, take half a pint of milk with some lime water and feed it to the baby once in a while. The simplifying of infant feeding has made general practititoners feel that the feeding of an infant is merely a matter of putting some milk, some water and sugar together and giving it every once in a while. It is surprising how well some children do in spite of feeding.

The question of simplifying infant feeding is a very important one. The only way of simplifying infant feeding is forcing the mother to hold the child at the breast until you know absolutely that she can not feed it there any longer. The thing for us to do as pediatricians is to endeavor, if possible, to find some way to induce the mother to feed the milk. My personal experience has not been that the mother wanted to give way to her feelings or not nurse the child, but she could not do it, and my efforts have been to help her in every way possible; and when I could not, then to use simplified or use what I call whole milk dilutions and not modified milk. I do not care how much water, sugar or lime water or soda you put in the milk, you will not modify it; you merely dilute it. You can not change sugar of milk into anything else and not change the fat by simply adding water or by adding dextri-

maltose. I call that dilution of milk. I use whole milk and dilute in a certain proportion, trying to use as near as I can body service, weight, age, and stomach capacity of the child as a guide. If we use as an index a gain in weight, we would have the child running up to eight and nine ounces in a week and patting ourselves on the back that we are running the child splendidly, when, as a matter of fact, we are running into disease or disaster. We do not notice the red light ahead. The mother is satisfied with eight ounces gained and we try to keep it up. We must consider the interval gain in weight on the general disposition of the child and stools. Our feeding infant is supposed to gain according to the line of scientific average for the individual child, and I do not believe, outside of the mother's milk, there is any other way of simplifying feeding.

As to boiled milk, Hess, of New York, has proven that boiled milk very seldom or never causes scurvy, and according to the investigations of several pediatricians years ago it was shown that several children on mothers' milk had had scurvy. Dr. Goldberger, who will present a paper tomorrow on pellagra, will speak on this subject, but I would question whether a child had pellagra that was perfectly fed on the diet prescribed, and still he called it pellagra. I believe in boiling milk during the hot months, using low dilutions of fat, sugar and proteins, and increasing them according to the standards I have stated. Boiled milk in itself will cause scurvy. If it does, the danger of infectious diarrhea is so much greater and so much harder to treat than the scurvy, so I believe we had better boil the milk.

Dr. W. W. Harper, Selma, Ala.—When we realize that two out of five babies born in this world never celebrate their fifth birthday, and a large percentage of those babies die from faulty feeding, it is time for the doctors of this country to wake up to the importance of regulating the feeding of infants, and not let the old grannies in the neighborhood do so. I have had intelligent practitioners tell me that some woman who has raised a dozen children is more competent to feed a baby than a doctor. Gentlemen, this is a disgrace to the profession. We ought to know what a baby needs and know what to put in its stomach. If we woke up to the fact of knowing what should go into the infant's stomach and what it can digest, we would lop off one-fifth of the mortality in this country. According to statistics, the value of a baby is $300. Figuring it on this basis, the City of Atlanta is losing $350,000 a year from the loss of babies.

Dr. King, of New Zealand, shows that unless he could give guinea pigs one maternal nursing he could not raise a single guinea pig, but if the guinea pig had one maternal nursing he had no trouble in raising guinea pigs.

Nursing infants are peculiarly immune to contagious diseases. The infant nursing from its own mother acquires her immunity, and that immunity the infant gets from no other mammalian animal.

Do not feed babies over 3½ % cows' milk for any length of time, otherwise you will get into trouble. The baby thrives for a while. Unless he develops fat he is going to get you into a peck of trouble. Babies can not digest cereals under six minutes, and to use cereal dilutions every six minutes upsets the infant. If you are going to make up seven feedings a day, make them up at one time, put them in a five- or six-ounce stoppered bottle, with cotton; put the bottle in a boiler, and put a thermometer in the water and heat the water to 170°. If kept there for forty minutes it will destroy all pathogenic bacteria. Keep the supply in an ice box, and when the mother is ready, immerse the bottle in warm water, shake it up, pull out the stopper and the child will be getting what it ought to have. You are not running the risk there of having from the mixture 25 % fat at one time and the next feeding no fat at all. It is true, the average mother will not shake the bottle and trusts to her negro nurse and she is not careful about sterilization. Do not change the formula every time the child does not show a gain in weight. Look out for something else. Otitis media may be the cause of the child losing weight, and it is not the fault of the formula.

Dr. J. G. Dupuis, Lemon City, Fla.—The baby is a unit unto itself. Do not let us lose sight of the fact that a baby is like a plant. What is good for one baby is harmful for others. The point I wish to make is, we hear a great deal about sterilizing, pasteurizing and boiling milk, but let us remember the fact that if we want to simplify the feeding of babies it is necessary to understand that if we wish to grow a plant we must bring about a phosphoric acid condition, and many of the things placed in the soil, sand or peat, will not produce a plant; neither will fat, proteins and carbohydrates placed in water produce a healthy baby. The point is we should not boil the milk. It removes the immunity toward the bacterium that causes the things within the food to make the tissues in the body grow and assimilate these ingredients. The simple fact I wish to call attention to is to put your foot down upon boiling good wholesome milk. We do not boil mothers' milk, and we say the only substitute for mothers' milk is cows' milk. We should remember the fact that when we use the things that cause these things to be assimilated to make tissue, to appropriate life within the living, we are placing the horse behind the cart.

Dr. L. B. Clarke, Atlanta, Ga.—I agree with what one gentleman said with reference to cows' milk. In fifteen years' experience I believe that if a baby is doing well, let it alone. You may make bad matters worse if you do not; but I hesitate to make this statement, as it is somewhat dogmatic: I have not had one single baby in those fifteen years that I could not raise on cows' milk in some shape. I agree with the idea that milk should be properly modified and not diluted. I agree with the gentleman who wants to use raw cows' milk and not cooked. While I have not used boiled milk experimentally nor worked out the problem to my satisfaction, the great bulk of my expeience has been in feeding raw cows' milk of low bacterial count, pure and fresh.

There are features in connection with this subject that have been lost sight of by many of us. Those features are along these lines: we are living in the South; the education we have had in regard to infant feeding to a great extent

has been based upon observations made in Eastern and Northern cities. A baby here and a baby in Boston are two different individuals. The people who live in Iceland, in Greenland, live on blubber and whale oil. The people here can not digest this, and the teaching of the East regarding the modification of milk by using top milk will fail in this part of the South. It will not do. Undoubtedly fat is the most difficult ingredient in milk to be taken care of.

The question of heating milk, sterilizing or pasteurizing it, has received great attention on the part of investigators recently. In the past week a long article along that line came out. It has been my experience, contrary to what has been stated here, that boiled milk will produce scurvy.

Dr. Varden (closing).—I do not think there were any questions asked; if there were I could not hear them, but I would like to make a reply to the remark of whether or not boiled or raw milk is to be used. Those who discussed the subject seem to lose sight of the fact that milk which is boiled is boiled for two reasons. It is not boiled simply for the purpose of destroying pathogenic bacteria; it is boiled just as often for the purpose of converting the casein mass into a digestible one. If there is any advantage in the boiling of milk it is due to the fact that the casein mass is changed, the mass that is found in the stomach, and is passed through into the intestine. If the casein mass is hurried through as it often is on account of fat, it acts as a foreign body and is not going to be digested.

With regard to the results obtained by many men who decry the use of raw milk, I would say that in the majority of instances they recommend a preparation which owes the result obtained by its use purely to the fact that it is a boiled preparation. I refer to the almost constant use of malt soup products,—barley water, soda added if necessary, extract of malt, with 1% of potash, boiled 20 to 40 minutes. It is my belief that the results obtained from it are due to the fact that increasing the amount of milk can be taken below ages, for that amount can be taken in a raw state, and the gain in weight is due to that rather than to the added malt extract which is used in quantities of half a teaspoonful and two teaspoonfuls, representing a caloric value of 90, which is little more than half an ounce of milk.

A PHENOMENOM OF HYPERTENSION READING

By L. B. Newell, A.B., M.D.,
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During clinical measurements of arterial hypertension by means of the spygmomanometer I have occasionally observed a phenomenom which perhaps others who employ these instruments in routine work also have observed.

After one has raised the air pressure beyond the point of complete obliteration of the radial pulse and, in the usual manner, allows the pressure to fall gradually, it is not uncommon, in cases of hypertension, to feel one or more full pulsations at the wrist, then a total cessation of the pulse-beat while the air pressure continues falling, then one again feels the pulsation. This may be repeated one or more times during the reading. Checking this observation by the auscultatory method, we find the same thing occurring. Often there is a drop of ten or more millimeters after the first sound or pulsation before another is heard or felt. There are now in my care several patients in whom I constantly find this peculiar phenomenon.

So far as I have been able to search the literature, no mention of this has been recorded. My observations seem to indicate that it occurs only in cases of hypertension.

At present I have no explanation to offer; in fact, it may be perfectly easily explained. Perhaps there is an irregularity in contractility of the heart muscle. Cases of intermittent heart beat, with lost pulse beat, are of course excluded.

I merely wish to record this observation with the hope that the attention of others may be directed thereto.

THE TUBERCULOSIS OF INFANTS

By Mary E. Lapham, M.D.,
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Tuberculous processes in the bronchial glands of infants may begin in the first days of life and remain concealed for an indefinite period without arousing any suspicion of their presence; or, for various reasons, we may suspect but can not confirm our suspicions; or, they may induce systemic disorders of function which are thought to be primary and thus mask their tuberculous nature; or, they may declare themselves specifically by cough, dyspnea, asthma, etc.; or, by secondary metastatic manifestations in the lungs, meninges, skin, bones, joints, etc.

The two chief primary effects of tuberculosis of the bronchial glands in infants are caused by pressure upon the trachea

and bronchi and by the absorption of toxins. If there are no pressure effects, and the processes in the glands do not furnish enough toxins for toxemia, there are no symptoms.

The pressure of the enlarged glands upon the trachea may cause death when the caseating glands perforate the air passages and fill them with the caseating masses; or, when infectious materials are carried to other parts of the lungs and induce caseous or broncho-lobular pneumonias, acute miliary tuberculosis, the typho-bacillemia of Landouzy, meningitis, etc.; or, when the walls are so closely approximated that the stenosis prevents the passage of air. When the stenosis does not cause death it may persist indefinitely as chronic tracheo-bronchial stenosis with more or less serious consequences.

The symptoms suggesting pressure upon the walls of the trachea and bronchi are caused by irritation of the pulmonary nerves lying upon their surfaces and by the obstruction to the passage of air. Typical irritation of the nerves causes high-pitched, highly explosive, paroxysmal attacks of coughing, very metallic and resonant, sometimes clinking like broken glass. When these attacks are followed by vomiting they are often mistaken for whooping cough. When recognized they are so pathognomonic that the diagnosis of tuberculosis of the bronchial glands may be made at once. Unfortunately this warning cough is not always present. There may be no cough at all, or it may be of quite a different nature, like the bellowing or baying of a small hound, or so insignificant as hardly to attract attention. If there is no cough to warn us, pressure may cause erosion and perforation of the trachea and bronchi, which become filled with the glands. Then the air can not pass and the first indication of the danger is sudden, severe dyspnea, which is often mistaken for croup, diphtheria or laryngeal obstruction until intubation proves that the obstruction is below the larynx. The suffocative dyspnea is usually followed rapidly by cyanosis, unconsciousness and death, unless the passage of a sound, surgical intervention or coughing clears away the obstructing masses.

Goodman quotes a case of Knoepfelmacher of a child, aged 2½, who had been under treatment eight days for diphtheria. Tracheotomy had been performed for sudden extreme dyspnea. The trachea was found to be free, but the dyspnea and pulmonary emphysema persisted. The necropsy confirmed the suspicion that the right main bronchus had been blocked by a tuberculous lymph node. Sternberg reported the case of a child, aged two, who died suddenly after the rupture of a caseated mediastinal lymph node into the trachea. The point of rupture was at the bifurcation.

Coakley reported a death through suffocation due to pressure of a tuberculous mediastinal lymph node on the trachea. The patient was a girl, aged three. Necropsy showed an oval mass 2.5 mm. in length, lying underneath the tracheal mucosa and entirely blocking the lumen.

The deaths in the tuberculosis of infants are usually from acute miliary tuberculosis, caseous or broncho-lobular pneumonias. Weigert was convinced that acute miliary tuberculosis is usually caused by perforation of a vein by caseating bronchial glands. Aronade reports two cases of acute miliary tuberculosis: one was an infant three weeks old who died at the age of four months. At the autopsy miliary tuberculosis of the lungs, liver, kidney and spleen was found, which had started from caseating bronchial glands. The second infant was supposed to have died from "bronchitis" after an illness of two months, and during this illness no suggestions of tuberculosis had beeen recognized. At the autopsy acute, generalized, miliary tuberculosis was found to have originated in the bronchial glands.

Death from stenosis of the trachea and main bronchi may be preceded by the same high-pitched, explosive, paroxysmal whooping cough that precedes perforation, and for the same reasons, irritation of the pulmonary nerves. In some cases this is the first and only symptom for some time; in others it is preceded and overshadowed by exspiratory dyspnea; in others it does not appear at all, or is of a different nature.

Dyspnea is the most constant and reliable symptom of obstruction to the passage of air, and suffocation the cause of death.

Rach reports cases of Guinon's showing the typical consequences of compression of the trachea and main bronchi in a nursling. When the infant was three weeks old, it began to breathe badly; after three months the dyspnea was severe, exspiratory and strident; during sleep the exspiratory stridor lessened and disappeared; there was an occasional high-pitched cough; physical findings negative. After three months the cough became so severe and noisy that the child could not sleep; the dyspnea became extreme so that the head was ryhthmically drawn over and the lower ribs drawn in with each inspiratory effort; the clinical picture was that of suffocation, capillary bronchitis and the child died of suffocation. At the autopsy, the trachea and left main bronchus were found compressed by enlarged tuberculous glands.

A second case of Guinon's began at four months with exspiratory, piping dyspnea and noisy rales seeming to come from fluids collected in the trachea; the floating ribs were deeply drawn in by inspiration and death resulted from convulsions and suffocation. At the autopsy enormously enlarged glands were found pressing upon the anterior wall of the trachea and right main bronchus.

Rach also quotes a case of Variot and Bruder's: At four months of age the baby began having attacks of coughing whenever it was moved. With these attacks there was expiratory whooping, very high-pitched, persisting even during nursing, although sometimes ceasing during sleep. The thorax was markedly distended; there was hyperresonance on the left; no retraction of the ribs; no attacks of suffocation. The whooping was not relieved by intubation, so it was inferred that it could not originate in the trachea or bronchi. The larynx was normal and there was no nasal obstruction. It was concluded that the whooping must come from the bronchi and it was, therefore, called "cornage expiratoire bronchitique."

In cases of incomplete or partial stenosis of the trachea and bronchi the obstruction does not cause death, but a chronic condition characterized by expiratory dyspnea. When the chest expands the walls of the bronchi and trachea are relieved by pressure, the stenosis is lessened and the air enters noiselessly. As the chest wall falls back again the stenosis returns and the escape of air past it is delayed. As the stenosis increases the residual air accumulates until finally expiratory dyspnea develops, which has the same basis as the dyspnea of bronchial asthma from other causes—that is, inspiration is easier than expiration. It is not strange, therefore, that the expiratory dyspnea of the tracheobronchial stenosis of infants should resemble that of asthma, nor that asthmatic attacks should develop as one of the first symptoms. When the stenosis acts as a mouthpiece to a whistle it may cause expiration to be noisy, strident, sterterous or whooping.

Combe says that the attacks of dyspnea and coughing may be typically asthmatic and that the most important sign of tuberculosis in the nursling may be expiratory stridor, suggesting asthma.

The infant trachea is very flexible, yields readily to the pressure and thus the retention of air may develop very early and with it the expiratory dyspnea and asthma. Inspiration is silent, while expiration is noisy and prolonged, but the infant does not seem to notice it and keeps gay and smiling unless the asthma is too severe.

When this asthmatic condition develops it is a very reliable factor, because it is not associated with any other etiology in infants. Frequently a bi-tonal cough is associated which sounds as though it came from two larynges because pressure upon one recurrent nerve may cause lack of symmetrical functioning of the vocal cord and a difference in the pitch of the sound emitted by each. Barthez and Rilliet describe attacks of rough, painful, whooping asthma coming on usually in the afternoon, and often associated with hoarseness, which they thought were caused by pressure upon nerves because the larynx was normal. These attacks of asthma are usually intermittent, tend to come on toward or during night and often are associated with rales, especially in the region of the hilum.

The cough and other symptoms are the same as in fatal tracheo-bronchial stenosis. As the severity of the cough and dyspnea increases, vomiting may prove a distressing complication. As bronchitic conditions develop, expiratory rales are

very common and very characteristic. "I regard these as very reliable and valuable symptoms which afford us the diagnosis of tuberculosis at once without the necessity of further proof when they are present. As a rule we meet with these symptoms in relatively well-nourished or even fat babies, and we would never think of tuberculosis if it were not for these expiratory rales. Very often the mothers bring these babies to us because they hear these rales themselves, and when they are chiefly expiratory we confirm the diagnosis by tuberculin."

Hamburger makes a diagnosis of tuberculosis in infants when there is a paroxysmal cough, expiratory dyspnea and rales. Often there are evidences in other tuberculous foci, such as tuberculides, scrofulides, enlarged cervical glands, etc. Hamburger says that any tuberculous focus in the body pre-supposes tuberculosis of the bronchial glands.

The symptoms caused by the absorption of toxins are vague, indirect and often misleading. We are accustomed to the loss of weight and appetite, fever, cough, sweats, etc., but we are not accustomed to tracing out the logical effects of the persistent absorption of toxins upon the functional activities of the various systems.

The fundamental consequences of tuberculous toxemia are seen in the functional disorders of the various systems, which disorders in no way differ from those produced primarily in the same system by other causes. In infants, the systems chiefly affected are the vasomotor, gastrointestinal and hematopoietic. It is possible that the first and fundamental trouble is in the vasomotor system shown by the fall in blood pressure and relaxation of vascular walls, so that the circulation in the gastrointestinal and hematopoietic systems becomes sluggish.

Gagnoni thinks that it is not only adrenal insufficiency, but depression of the sympathetic ganglia and cords as well.

Combe believes that vaso dilatation is an early and important manifestation of the tuberculosis of infants and that the cyanosed lips and finger nails may contrast sharply with the white, anemic face.

It has often been found that some form of the exudative diathesis had preceded the manifestation of tuberculosis, some eczema, angio-neurotic edema or herpes. Eruptions are very common; erythemas, especially erythemia nodosum, tinea versicolor, acniform eruptions, tuberculides, etc., suggest irritation by tuberculous toxins. The excessive growth of hair is said to be due to the sluggish circulation in the skin and the thick, mottled, blotchy complexion has been thought to reflect the sluggish circulation in the gastrointestinal tract. Mucous membranes are rendered very sensitive, possibly on account of anaphylaxis, and so there is a pronounced tendency to "colds," "snuffles," coryzas, bronchitis and pneumonia. Spasmophilia and chorea frequently precede tuberculosis so that one asks, is this a vagotonic manifestation? Certainly the autonomous systems are greatly exposed to tuberculous toxins.

The functional activities of the digestive system may be stimulated, depressed or paralyzed. Over-stimulation has been said to be due to the sluggish circulation and stasis causing hyperemia of the gastric mucosa and over-production of hydrochloric acid. Such a baby suffers from hyperacidity, but gets along fairly well. The food may come up and the lips get sore, but the babe has color, strength and vivacity. It is restless, noisy and fretful, but it eats.

In the depressed cases there is anacidity, lack of appetite, marked constipation and apathy. The baby is not restless, but lies still and quiet and turns away from its bottle with a sickly, wailing cry.

An extreme degree of loss of digestive capacity rivaling atrophy of the gastrointestinal tract has been described by Pollak. At first the babe is well-nourished, rosy and smiling. All goes well until the proper gain in weight is not made, and this inability persists. Even then the babe does not seem sick. Aside from the lack of weight it seems well enough, but eventually the child not only does not gain but begins to lose weight, becomes pale and then fails in vivacity and vigor. Gradually the eyes become dull, the facial expression is sad and a typical picture, called by Pollak "the tuberculous habitus," develops. There is an excessive growth of lanugo, especially over the temples and between the shoulder blades. The eye lashes are silky, long and curly; the muscles flabby; the bones prom-

inent. The babe wastes away and dies of marasmus. In this wasting process there are no signs distinguishing the tuberculous from other etiologies and nothing significant of tuberculosis so that it is not suspected.

In all the tuberculous disorders of nutrition, there is nothing specific, nothing to suggest tuberculosis. Usually, it is not suggested and not thought of and the case is treated as though it were primarily a disease of gastrointestinal organs, without any regard to its tuberculous etiology.

The same is true of the masked cases of the hematopoietic system, which are treated as primary cases of chlorosis and anemia. There is scarcely a gastrointestinal or hematopoietic disorder of function which can not be simulated by tuberculous toxemia, from simple chlorosis to pernicious anemia with the same large, dark, oval cells, increased color index, poikilocytosis, etc. It is not necessary to describe the various anemias, indigestions, and dyspepsias of infants. They all have their counterparts in a tuberculous etiology so that it does not seem unreasonable or exaggerated, to suggest that any and all conditions of disordered gastrointestinal functions in infants should demand the exclusion of tuberculosis.

It sometimes happens that in making routine examinations of babies we find enlarged glands in the X-ray plates and obtain a positive tuberculin reaction. In the absence of all corroborative, clinical and physical proofs, what shall we infer? Can we say that a babe has tuberculosis when there is no impairment of health? No symptoms? No physical signs? It certainly seems far-fetched to tell the parents of a flourishing, healthy babe that it has tuberculosis, but would it be exaggerated and far-fetched to tell the parents that there were tuberculous processes in the bronchial glands, which, so far, had not affected the health, but which might do so in the future? Would we be justified in making such a diagnosis?

We know that death from perforation, acute miliary tuberculosis, caseous and broncho-lobular pneumonias and meningitis may come on without the slightest warning. Where were the symptoms while these processes in the bronchial glands were ripening to their fatal termination?

Pollak says that tuberculosis of the bronchial glands does not always cause symptoms and that a positive tuberculin reaction simply means resistance without there being any clinical activity. Clinical inactivity is an expression belonging only to the present and not to the future for a case which is clinically inactive today may be clinically active in the days to come. Pollak reports three cases of positive tuberculin reactions in which all symptoms were lacking during the first year of life and did not appear until 8½, 14½ and 18½ months later on. Pollak also says that of all the cases of tuberculosis of the first year of life one-third passed into the second and third years without manifesting any indications for anxiety.

Tuberculosis of the bronchial glands is not necessarily a wasting or cachectic disease. The fatal cases of perforation and its consequences, and tuberculous meningitis, almost invariably occur in well-nourished babies. Engel says: "As soon as I learned that the tuberculosis of nurslings was by no means necessarily a wasting disease, I began to study infants in flourishing condition without a trace of tuberculosis." Combe also says: "Since I began giving all infants a Mantoux test I have been surprised to find how many give positive reactions when there is no sign nor symptom of tuberculosis."

Since all manifest cases of tuberculosis pass through a period of development when there are no symptoms nor physical signs, or both are absent, it would seem reasonable to suggest that the best time to study the prevention of manifestations would be during the clinically inactive stage. If we could study the tuberculous processes in the bronchial glands of children we might discover that they constitute the primary source of infection from whence secondary metastasis may develop in the skin, or bones, or joints, etc. If we could detect this primary focus of infections in infants, could we do anything to prevent the secondary developments in the spine, the hip joint, the cervical glands, etc., and all the devastating consequences filling the orthopedic world? Could we ever learn how to keep a pri-

mary from becoming a secondary process in the lungs, etc.?

We have learned that properly to combat tuberculosis we must begin with the school children and not let it go on into later life. It may be that we shall have to leave the school children and come back to the cradle. v. Behring says that the first verse of the death song heard at the grave of a victim of tuberculosis was sung over the cradle of the babe.

DERMATOLOGICAL CLINIC*

By H. H. Hazen, M.D.,
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PEMPHIGUS

Case I.—The patient is a white male aged about 26 and a lineman by occupation. The family and past history of the patient are unimportant. He has had several attacks similar to the present one. The present illness began about two months ago with the formation of vesicles upon the limbs. Examination shows that upon the entire cutaneous surface of the body and upon the mucous membrane of the mouth there is a scattered eruption consisting of vesicles and small bullae varying in size from 0.5 to 2 cm. in diameter. In the mouth these lesions are frequently confluent. Many of them are covered with scabs and scales. The Wassermann is negative. The temperature has ranged from 99 to 101° F.

In considering this case we must exclude various other bullous diseases. Epidermolysis bullosa is a congenital disease and the lesions are produced by friction. Dermatitis herpetiformis is always associated with much greater itching. Bullous formation in syphilis affects only young children suffering from the congenital type of the disease. Bullous impetigo would not show remissions. Septic conditions which are sometimes complicated by bullae usually lead to speedy death. The bullous type of erythema multiforme is chiefly found in newly-arrived immigrants and in children. The lesions do not last so long as in this case. Foot-and-mouth disease would not show recurrent attacks.

The etiology of pemphigus is unknown, but in certain instances it is probably due to skin infections. In general the prognosis is bad. There are a number of forms of treatment that have been advocated. Some men prefer the continuous tub, others a totally dry form of treatment, keeping the patients covered with an insoluble powder. Still others report excellent results from intravenous injections of quinine.

URTICARIA

Case II.—The patient is a policeman, about 35 years of age, whose family and past history are unimportant. Several years ago he developed urticaria, and within the past year large, deeply pigmented spots have appeared upon the body. His general health is excellent. Examination shows a marked factitious urticaria and variously-sized and shaped areas of a deep grayish-brown pigmentation upon the skin of the body and limbs. The mucous membranes of the mouth are normal. This evidently is not a case of urticaria pigmentosa, for the pigment formation bears no relationship to the wheals. One must think of Addison's disease, although there is no weakness and the systolic blood pressure is said to be normal. The functions of the endochrine glands should be investigated.

PSORIASIS

Case III.—The patient is a white male, aged 45, who shows upon the extensor surfaces of his arms and legs a number of inflammatory areas that are covered with feathery, white scales. When the scales are removed, minute bleeding points may be seen. The case is a typical one of psoriasis. The etiology of psoriasis is still unknown. In this respect it may be of interest to call attention to the fact that those persons who are associated with patients suffering from psoriasis not infrequently develop seborrheic dermatitis. In fact, some dermatologists feel that psoriasis is only a special form of seborrheic dermatitis. In regard to treatment the most efficient remedy is a weak ointment of chrysarobin, which must be thoroughly rubbed in. During this procedure the kidneys should be watched. The X-ray will clear up such cases beautifully for a time, but the lesions always return. The

*Before the Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1917 (Clinic at Atlanta Medical College).

auto-serum treatment has proven unavailing in the hands of many excellent men.

ECZEMA

Case IV.—The patient is a fat child aged about eighteen months who shows a typical acute eczema of the face. This form of eczema is rarely seen except in very well-nourished children and its successful treatment depends largely upon the elimination of fats and carbohydrates from the diet.

VON RECKLINGHAUSEN'S DISEASE

Case V.—The patient is a Negro, female, aged 28. Upon examination she shows several hundred superficial tumors which vary in size from 0.5 to 4 cm. These are scattered over the entire cutaneous surface with the exception of the palms, soles and scalp. In consistency they are soft and when the overlying skin is picked up they readily slide backward. They are not painful to the touch. In addition there are a large number of small pigmented spots upon the body. The mentality is apparently normal. This is a typical case of Von Recklinghausen's disease and is stated to be rare in the Negro. Pathologically the lesions consist of neuro-fibromata. Aside from the deformity there is some danger of sarcoma developing in the tumors. The only treatment is surgical.

SYPHILIS

Case VI.—The patient is a white woman, aged 40, who shows upon her upper lip near the angle of the nose a ring of small nodules which are yellowish in color. The diameter of the ring is about three-quarters of an inch and the individual nodules are from an eighth to a sixth of an inch in diameter. Rosacea and the various multiple benign tumors might give such an appearance, but the lesion is fairly typical of nodular syphilis and the Wassermann is strongly positive.

AUTHORS' ABSTRACTS

Medicine

Further Study of the Histopathology of the Autonomic Nervous System in Goitre. Louis B. Wilson, Rochester, Minn. The Journal of Laboratory and Clinical Medicine, Vol. II, No. 5, February, 1917, p. 295.

The author has previously reported on the histologic study of sympathetic ganglia from 28 patients with exophthalmic goitre and from many control cases. He has found in all exophthalmic goitre cases examined various degrees of degeneration in the nerve cells of the cervical sympathetic ganglia which in stage and intensity are parallel to the stage and intensity of the symptoms and to the hyperplastic and regressive changes in the thyroid. The present report confirms the preceding by detailing and illustrating the lesions in several more cases, by describing the experimental production of similar lesions in the cervical sympathetic ganglia of goats, and by demonstrating, by means of Born wax reconstructions of groups of cells in serial sections, the irregular distribution of affected cells in a given area in the ganglia. The findings suggest that the primary lesion of exophthalmic goitre may be a bacterial infection of the cervical sympathetic ganglia.

The Treatment of Eczema. Oscar L. Levin, New York, N. Y. Medical Review of Reviews, Vol. XXIII, No. 2, February, 1917, p. 120.

Eczema is a catarrh of the skin in which the visible and palpable lesions are cutaneous manifestations of some constitutional disturbance, usually intestinal, made manifest by some direct exciting agent. It is important to be able to recognize the various lesions of eczema and to comprehend the pathology of the various types. Treatment consists in the detection and removal of the general and local predisposing factors and the irritant, to correct the pathology, and relieve the symptoms.

For the treatment of the constitutional conditions predisposing to eczema it is necessary to obtain a careful history and make a thorough physical examination. The laboratory should be employed for the detection of abnormal state or function of the system. Cutaneous tests are made to determine the presence of food anaphylaxis and where this exists the patient should be desensitized. The diet is investigated and corrected. All general measures to improve the constitutional condition of the individual are employed. Various drugs are administered internally for the constitutional effect or for their direct action upon the skin. It is emphasized that arsenic should never be administered in eczema, as it tends to increase the catarrh.

The treatment of the local predisposing factors consists in making an examination of the entire integument, the proper management of any congenital or acquired abnomaly or disease thus found, and the prevention of irritation.

Measures are always taken to prevent mechanical, physical or chemical irritation from without and the elaboration of internal irritants, particularly in the intestines.

The local treatment depends upon a clear understanding of the pathology, interpretation of the lesions and the application of remedies to correct the abnormal anatomy and function. The aim should be to relieve the catarrh, to soothe and protect, and stimulate when indicated. For acute erythematous eczema wet dressings and mild lotions are employed. These constrict the blood vessels, favor absorption of the exudate, promote evaporation and cool the skin, and thus soothe, protect and relieve the burning and itching. When itching is severe phenol 1 to 3 % or

menthol 2 to 4 % strength is added. In persistent erythematous eczema 5 % ichthyol is added.

Lotions are used for acute papular eczema. Glycerin should not be employed in cold weather. When it is too drying, distilled water should be used instead of lime water. When papular eczema tends to become chronic liquor carbonis detergens, four grams to the ounce, should be added.

In acute vesicular eczema pastes, lotions and wet dressings soothe and protect the skin, remove the exudation, and promote evaporation. Ointments are not used. A paste contains approximately equal parts of powder and fat. Crusts are removed by covering the lesions with vaseline, or a bland oil, or by frequent changes of compresses wet with equal parts of witch hazel and hot water. When there is a severe inflammation with a thick covering of crusts and scales a boric-starch poultice should be used for two or three days.

For chronic papular eczema the most efficient remedy is some form of tar. Glycerin should be added to the preparation to prevent too drying an effect in lichenified eczema. Salicylic acid is useful and aids in diminishing the thickness of the skin. For lesions of excessive hyperkeratosis and acanthosis a weak chrysarobin ointment will hasten resolution. This drug should never be used on the face. An exposure of a patch to a fractional dose of X-rays often relieves the itching and hastens a cure.

In chronic vesicular eczema the remedies for the acute form should be used if there is evidence of acute inflammation, and later, when the acute symptoms have subsided, ointments containing tar and salicylic acid are employed. A 1 to 10 % solution of silver nitrate painted daily upon lesions with denuded superficial layers of the skin and prolonged profuse exudation, with Lassar's paste without salicylic acid applied twice a day in conjunction, is useful. In obstinate crusted vesicular eczema the parts may be bathed twice a day with hot water and soap, and after drying thoroughly an ointment containing 5 % of ichthyol and resorcin with 2 % of salicylic acid is applied. When desquamation sets in the bathing is used only at night and a paste containing 2 % of oleum rusci is employed.

The treatment of chronic squamous eczema is the removal of the scales by the daily application of a salicylic acid plaster, followed by the use of the ointments used in chronic papular eczema. The X-rays are also of service.

Water is not harmful, unless through prolonged soaking and maceration of the skin, or the presence of chemicals and irritants, and is often of distinct value. Various forms of baths are useful in various conditions.

Routine Milk Preparation for the Sick Child. John Allan Hornsby, Chicago, Ill. Interstate Medical Journal, Vol. XXIV, No. 3, March, 1917, p. 302.

The literature covering the physiology and chemistry of milk and the scientific formulation for feeding the sick seems to ignore the fact that the clinician's opportunities to become familiar with the preparation of milk formulas in the average home are limited, most of his active work in this direction being limited to the milk laboratories of the hospitals.

There are certain fundamental, if extremely simple, processes in home preparation of milk for the sick child; the utensils are found in even the poorest home, excepting perhaps a standardized thermometer.

Whether the milk is to be sterilized or is to stop short of that and is merely to be pasteurized, it can be done in a double jacketed rice boiler or earthenware cooking utensil; if the milk is to be sterilized the temperature indicated by a thermometer hanging in the fluid should be brought up to 180° F. and maintained for thirty minutes; this milk will be deprived of all life, including yeast, fungoids, and bacteria; the caseins will have been fixed and the albuminoids will have undergone certain chemical changes; the milk will have become indigestible until broken up by the addition of rennet, which must be stirred in slowly at a temperature of approximately 120° F.

If the milk is to be pasteurized, which means that the process has been stopped short of physiological and chemical changes in the milk, the same utensil can be used, the heat being held at 140° F. for twenty minutes. This will leave a small number of lactic acid bacteria as a protecting device against the inroads of pathagenic forms.

Whether the milk is to be sterilized or pasteurized, a certain very simple technic must be taught to the mother who is to prepare the food: bottles must be boiled, also the nipples and a sufficient number of bottles must be prepared to give the correct number of feedings for twenty-four hours.

At the end of the heating process, the milk must be poured into the sterile bottles and the nipples must be adjusted with sterile hands, preferably in sterile gloves; the bottles must be set into a vessel containing cold water or in which there is cracked ice, and the whole container set into a refrigerator or other cold place. A sterile towel or a sterilized metal lid covers the container. A bottle is taken out for each feeding, extreme care being taken that the hands do not touch the nipples or any part of the remaining bottles. The bottle intended for feeding is set in luke warm water, the temperature of which is gradually raised over the fire until the temperature of the water and of the milk in the bottle is raised to approximately 100° F.

Oftentimes in enteric troubles, the feedings must be commenced with warm sterile water in teaspoonful feedings at fifteen-minute intervals; a few drops of the warm pasteurized milk may be added, up to the capacity of the child's stomach to bear the concentration.

While this may seem rather complicated, the busy practitioner will find that the most ignorant mother will be able to prepare her baby's milk in this way and do it under aseptic and safe conditions.

TROPICAL DISEASES AND PUBLIC HEALTH

THE WORK OF THE U. S. PUBLIC HEALTH SERVICE WITH REFERENCE TO MALARIA*

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The extensive prevalence of malaria in certain sections of the United States, and the close commercial relations that have been developed between this country and the tropics, have necessitated consideration of this disease by the United States Public Health Service as a part of its functions of preventing the introduction of communicable diseases from without, and of developing control measures for such as already exist within our continental limits.

It is only in comparatively recent years that the widespread influence of malaria in the southern United States has been appreciated, as assiduous investigations have brought out the extent of its ravages and the multiplicity of its manifestations. The great losses in time and efficiency through chronic malaria, and its sinister influence as a producer of anemia, in retarding development, and in lowering resistance toward other diseases, have brought it prominently before the attention of sanitarians and economists as a problem of the first importance.

The interest of the Public Health Service has long been attracted to the question of malaria in connection with the administration of maritime quarantine because of the necessitated consideration of this disease in the differential diagnosis of febrile conditions arriving from tropical ports, and it was in relation to these that the preliminary studies were made from which the present investigations were developed.

The activities of the Public Health Service with reference to malaria have for their object the determination of the prevalence and geographic distribution of the disease in the United States, study of the conditions influencing its incidence, investigations of methods of diagnosis and treatment, the development of control measures for application under various conditions, and, finally, educational work as to its nature, cause and prevention.

It is to the indefatigable energy and rare investigative attainments of the late Surgeon R. H. von Ezdorf as a scientific administrator of quarantine procedure that this work owes its inception. Confronted with the necessity of differentiating quarantinable diseases, and eliminating malaria in questionable cases, Surgeon von Ezdorf undertook a series of systematic clinical examinations of tropical cases, and, later, during his tour of duty at the New Orleans Quarantine Station, extended his investigations to a scientific study of the parasites of the disease and their relation to the Anopheles mosquitoes. Extensive blood studies and mosquito dissections, together with rich opportunities for observation, afforded during his service in connection with yellow fever and quarantine duty in the South and in the tropics, gave him a profound knowledge of malaria and qualified him admirably for the inauguration of the investigations of which he was until recently in charge. His untimely death in September of this year deprived the Service of one of its most brilliant officers, and American sanitary science of one of its brightest lights.

Systematic investigations were undertaken, in 1912, by Surgeon von Ezdorf, in Mobile, Ala., where, in accordance with the Bureau direction of February 28, 1912, preliminary epidemiologic studies were begun in the State of Alabama with reference to Species of parasites, Index of infection in Mobile, Effect of quinin on parasites, and Species of Anophelines and their breeding places.

Offices and laboratory were installed at the U. S. Marine Hospital in Mobile, the personnel was increased, and, in the fol-

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lowing year, in co-operation with the State health authorities, the studies were extended. During the temporary absence of Surgeon von Ezdorf in Vera Cruz with the Naval forces, the investigations were continued under the direction of Assistant Surgeon-General Carter, and, at the same time, work was begun in Louisiana by Senior Surgeon White. During the same year, the use of quinin for the prevention of malaria was made available for beneficiaries of the Service upon application to the U. S. Marine Hospital offices.

In November, 1914, the general offices and laboratories were transferred to the U. S. Marine Hospital, New Orleans, La., where facilities for the conduct of the investigations were found to be more advantageous, and the scope of the operations was greatly enlarged. Extension of investigations has since been made to include a number of problems of especial public health importance, and systematic examinations are now being conducted in all of the Southern states.

1. *Scope of Operations.*—As now conducted, the activities of the Service with reference to malaria have been extended into the States of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, Tennessee, Texas and Virginia, and special investigations have been made in other states. The area of the United States in which systematic work is being conducted is represented on the accompanying map.

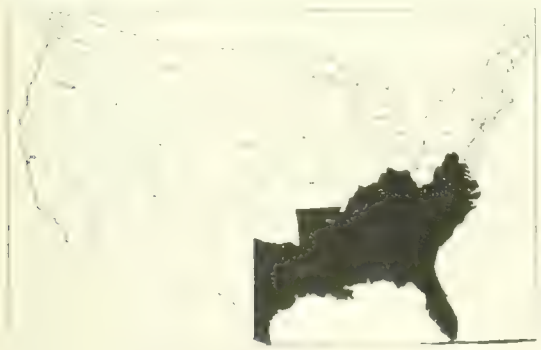


Fig. 1.
The area of the United States now included in malaria investigations by the United States Public Health Service.

2. *Collection of Morbidity Data.*—The method pursued by the Service for the collection of statistics as to the prevalence and geographic distribution of malaria and hemoglobinuric fevers has been through the issuance of circular return postal cards to health authorities and physicians in the different states. During the first part of this work these cards were sent out at monthly intervals, but in the past two years it has been found more advantageous that they be issued quarterly. The information received is tabulated at the expiration of the periods covered by the reports and the results in summary are made available. The following table (Fig. 2) represents the summarized returns from circular postal cards issued in ten states, the percentage of replies received, and the number of cases of malaria reported by physicians:

Fig. 2.

Reports of the Prevalence of Malaria in the States of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Texas

State	No. Years	No. Cards Mailed	No. Cards Received	% of Replies	No. Cases Malaria	No. Cases Hemoglobinuric Fever
Arkansas. . .	4	49,333	8,115	16.45	81,948	44
Alabama . . .	5	67,543	8,826	13.06	55,324	0
Florida . . .	4	20,336	2,744	13.49	19,056	3
Georgia . . .	2	15,044	1,722	11.44	13,570	3
Kentucky . .	3	48,990	7,637	15.58	14,692	0
Louisiana . .	3	37,831	3,267	8.63	31,020	10
Mississippi .	1	7,974	1,645	20.62	34,359	0
N. Carolina .	4	37,767	6,091	16.13	20,199	3
S. Carolina .	4	30,546	4,708	15.41	27,800	1
Tennessee . .	4	69,636	7,352	10.55	15,427	1
*Texas . . .	2	17,250	2,470	14.32	48,164	45
Totals . . .		402,250	54,577	13.56	361,559	110

*Eastern half. Cards sent to 110 counties only.

Extending the proportion of cards received in the above table to 100 %, there would have been reported, in the same ratio, 734,513 cases of malaria for the total population (1914) of 21,290,292 for the ten states, or, in other words, a rate of 3.5 %. Including as it does the whole population, this incidence is not possible of expression in terms of economic loss.

3. *Index Investigations.*—With a view of establishing the index of malarial infection for the Southern states and for specific sections, blood smears are systematically collected for examinations in the

laboratories at New Orleans. These specimens are taken by field parties and, upon completion of the examinations, reports are made to the local and state health authorities. Repetition of indices is made in such localities where anti-malarial work is in progress to check the efficacy of the operations as well as to study the distribution of the infection. The following table (Fig. 3) is a summary of all of the index examinations made during the period from the inception of the work up to the present time, with sub-divisions by states, the number of places examined, the numbers of white and colored smears taken with total percentage. The detailed analyses in age and color groups are available in a Service publication entitled "Malarial Index in the United States":

with examinations which have been made of blood specimens sent in by physicians in practice in different places. The Service laboratories have also been made available for diagnosis of malaria to physicians throughout the South and the data resulting from these studies have been included. The relative distribution of the three types of malaria shows a marked preponderance of the tertian type over estivo-autumnal, with quartan being found but exceedingly rarely. This relation is quite characteristic for the United States as a whole.

5. *Malarial Surveys.* — In accordance with requests, malarial surveys have been made at a number of points in the various states by field parties to determine the influence of local conditions on malarial

Fig. 3.

Malaria Index Examinations Made in the States of Alabama, Arkansas, Mississippi, North Carolina, South Carolina, Missouri, Virginia, 1912-1916

State	No. of Places	Year	Number Examined			Number Infected			Types of Infection			
			White	Colored	Total	White	Colored	Total	T.	Q.	Ea.	Mixed
Alabama	11	1912 to 1916	3,324	1,600	4,924	208	119	327	234		92	1
Arkansas	16	1913 1914	2,444	2,245	4,689	188	288	476	325		145	6
Mississippi	5	1914 1915	656	3,263	67	1	7	8	5		3	
North Carolina	8	1913 to 1915	4,415	971	5,386	271	113	384	303	1	78	2
South Carolina	1	1913	14	53	3,919	101	1,195	1,296	616	1	661	18
Missouri	1	1915	612	28	640	35	1	36	24		12	
Virginia	3	1914 to 1915	662	92	754	75	1	76	67		9	1
Totals	45	5	12,127	8,252	20,379	879	1,724	2,603	1,574	2	1,000	28

Percentage of whites infected, 7.24.
Percentage of colored infected, 20.89.
Percentage of total infected, 12.77.

4. *Types of Malaria Prevalent.*—The types of malaria prevalent in various sections have been ascertained through the examination of index specimens, together

prevalence and for the collection of material. In such surveys all of the local water courses are examined with reference to mosquito breeding, the prevalent

Fig. 4.

Points Included in Service Surveys

States	No. Places Visited	Names
Alabama	13	Anniston, Cordova, Florence, Fulton, Holt, Kaulton, Lannett, Leeds, Mobile, Montevallo, Plateau, Talladega, Tuscaloosa.
Arkansas	25	Altheimer, Arkansas City, Blissville, Brinkley, Blytheville, Crossett, Cummins, DeWitt, Dermott, Eudora, Forrest City, Helena, Lake Village, Little Rock, Mariana, Marked Tree, Monticello, New Port, Osceola, Stuttgart, Varner, Warren, Wilmar, Wilmot, Wynne.
Georgia	10	Americus, Brunswick, Columbus, Irwin, Ocilla, Savannah, St. Simons Island, Tifton, Tyby, West Point, Waycross.
Mississippi	7	Columbus, Cedars, Deer Island, Electric Mills, Greenville, Lucedale, Scott.
Louisiana	6	Bastrop, Crowley, Mandeville, Mer Rouge, Rayville, New Orleans.
N. Carolina	14	Edenton, Elizabeth City, Fayetteville, Goldsboro, Greenville, Hertford, New Bern, Knott's Island, Plymouth, Roanoke Rapids, Rockingham, Smithfield, Tarboro, Washington.
S. Carolina	7	Eau Claire, Ft. Lawn, Greenville, Hartsville, St. Helena Island, Sumter, Rock Hill.
Texas	3	Dallas, Marquez, Sherman.
Missouri	2	Crystal City, Henson's Lake.
Maryland	1	Points in Anne Arundal County.
Virginia	8	Emporia, Franklin, Matalia, Norfolk, Richmond, Toshes, Wakefield, Wilson.

species of Anopheles determined, and the measures most applicable for control are recommended to the local authorities, together with written reports covering the results of surveys in detail. For educational purposes in connection with the survey work, lectures are given usually illustrated by stereopticon views with a view to popular instructions as to the nature of malaria, and its cause and prevention. Local conditions are invariably discussed. Malarial surveys have been made, as indicated above, in the following places as summarized in (Fig. 4), showing the number of places visited in each state:

6. *Impounded Waters.*—A special phase of survey work has been developed in connection with the impounding of waters for power development and other purposes. The construction of artificial ponds by the damming of natural water courses has given rise to a very important series of problems with reference to malarial conditions, the study of which was begun under the direction of Assistant Surgeon-General H. R. Carter. Studies thus far have been made on the Yadkin, Coosa, and Black Warrior Rivers, Stephens Creek and at points in North and South Carolina, and Alabama, and have included physical examination of the terrain with reference to breeding of Anopheles, and biologic investigations to establish the conditions influencing such propagation and its public health importance. It is essential that further data on the effect of the impounding of waters on malarial incidence be obtained in view of the large amount of projected dam construction.

7. *Rice Culture.*—In the extensively flooded areas required for the cultivation of rice, opportunities are afforded for Anopheles propagation that are of especial interest with reference to malaria. Studies of seasonal variation, and possible methods of control, have been included in such surveys as have been made in rice-growing regions, and further investigations are being planned.

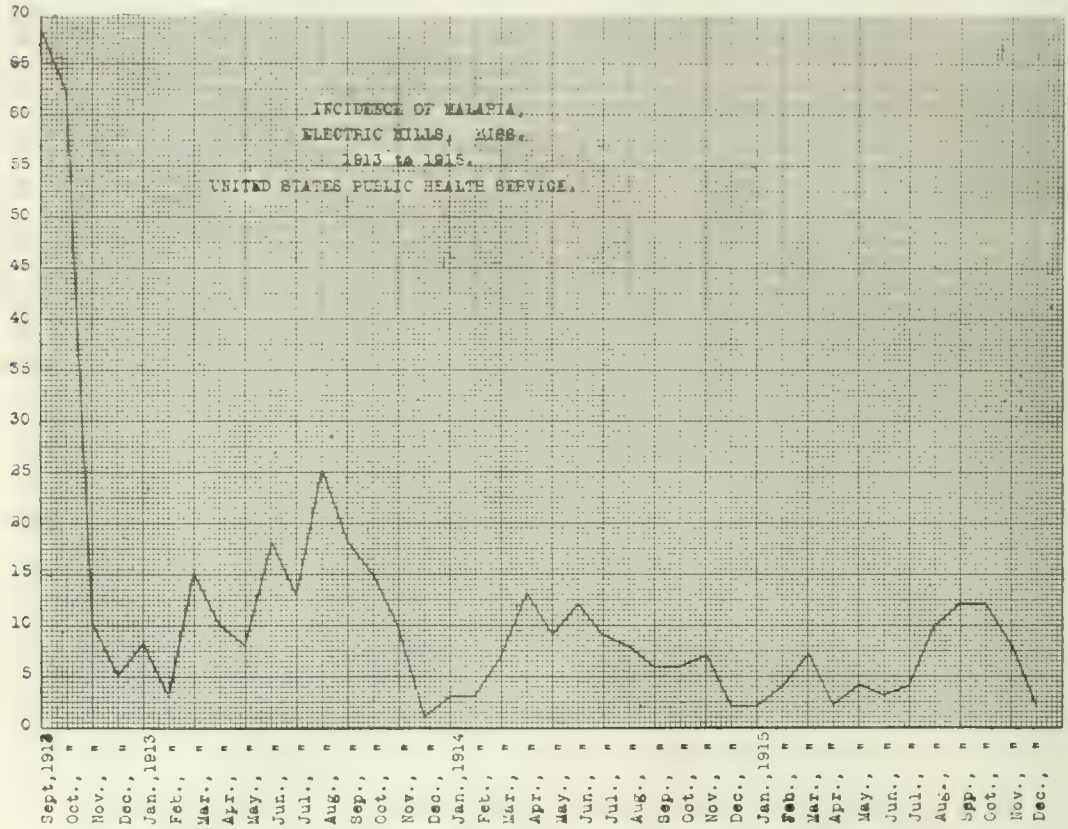
8. *Drainage Projects.*—The problem of drainage on a large scale is included in Service investigations, whereby mosquito control may be simultaneously gained. Much may be derived in the Southern states in connection with drainage projects.

9. *Laboratory and Scientific Studies.*—

In connection with the epidemiologic investigations, field and laboratory studies are being conducted to elicit data on many points on which further knowledge is urgently needed for practical application. These studies include biologic investigations with reference to mosquito bionomics and habits, flight distance, infectivity of different species, effects of temperature, etc. There are also being studied the efficiency of different larvacides and oils, survival tests for screening material, the effect of color on artificial breeding places and the applicability of waste materials and by-products in mosquito control. The results of a number of these investigations have been detailed in various Service publications.

clubs, etc., and the actual technique of the making of field surveys is demonstrated to high school classes, boy scout troops and the like. Health officers in various states have also been instructed in mosquito survey work by the Service. The Service publications referring to malaria are listed as an appendix to this paper and contain exhaustive information available for popular use, as well as technical reports of more especial interest to physicians and scientists.

Demonstrations.—The most effective method of instruction being that of objective demonstration, in a number of localities, after preliminary surveys have determined the most applicable remedial measures, the actual institution of anti-



Incidence of Malaria, Electric Mills, Miss., 1913 to 1915. United States Public Health Service.

10. *Educational Measures and Demonstration.*—Reference has already been made to illustrated lectures delivered for educational purposes in connection with Service operations. Addresses, with chart or chalk illustrations, are made to schools,

malarial operations has been demonstrated under the supervision of Service representatives with gratifying results. It is of interest here to review some of the results obtained in this work.

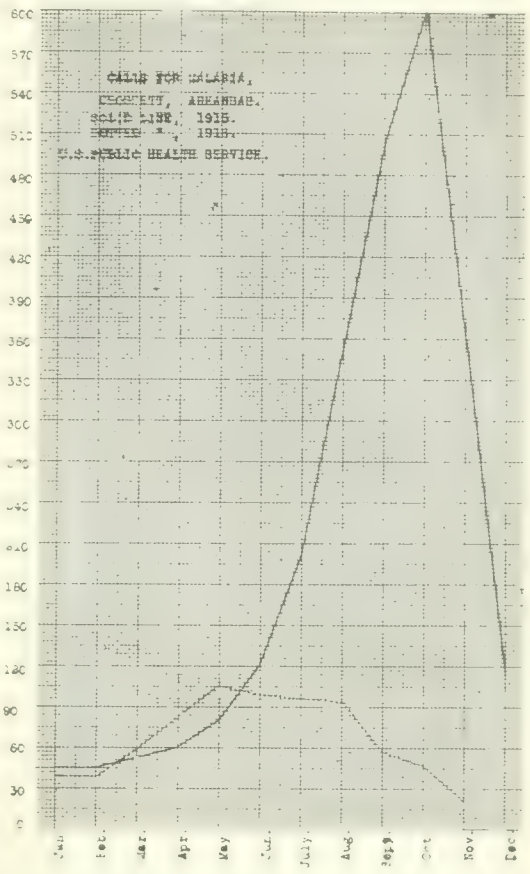
At Electric Mills, Miss., a lumber town,

in which malaria had been rife to the degree of constituting about 95 % of all illness in September, 1912, and seriously affecting the efficiency of the available labor, the application of anti-mosquito measures in accordance with recommendations made by a field party headed by Assistant Surgeon-General H. R. Carter brought about immediate control. The malarial index at this plant was reduced from 11.76 % for May, 1914, to 3.79 % in April, 1915, a reduction in the incidence of carriers of 67.7 %. The accompanying chart (Fig. 5) illustrates the monthly distribution of total cases of malaria as reported by Dr. Champenois, the local Health Officer, under whose immediate direction the work was done. The manager of the lumber mill stated recently that since then school attendance had greatly increased in regularity and that health and labor conditions were excellent.

At Roanoke Rapids, N. C., a town of 4,100 people, malaria had prevailed during the years of 1910 to 1913 to the extent of affecting 75 % of all of the population, and during the months of July, August and September of 1913, medical calls for malaria averaged about 50 per day, with, at times, from 3 to 7 members of a single family being simultaneously sick. The blood index in October of 1913 showed 13.75 % of endemic infections, or 1 person in 7. Following the survey, extensive preventive measures were adopted, including destruction of mosquitoes and their breeding places, screening of houses, the use of mosquito bars and the use of quinin prophylactically, with the result that by the end of the first year the average number of cases of malaria did not exceed one a day and of these it was estimated that 95 % were recurrences. Repetition of the blood index in October of 1915 showed but 3.51 % of infection, a decrease since the beginning of the work of 74.5 %. These works are being continued, and since then operations have been begun at Emporia, Va.; Bastrop, La., and Crystal City, Mo., where drainage measures chiefly are being used. At Cedars, Miss., because of the enormous extent of swamp and surface waters, quinin prophylaxis and screening are being used with, so far reported, good results.

In co-operation with the International Health Board, demonstration studies are being conducted in certain places in Arkansas. This work has been divided into two sections, a town unit at Crossett and a rural unit, including plantations, in the vicinity of Lake Village. At Crossett, Ark., a lumber mill town of 2,029 inhabitants, malarial control is being obtained through the sole use of control measures directed against mosquito breeding. The accompanying charts (Figs. 6 and 7) illustrate the calls made in Crossett for malaria, clinically diagnosed, in 1915 and 1916, and the incidence curve for cases of malaria for 1916 with color and sex subdivision. In connection with the Crossett work, anti-malarial control has been accomplished in the two logging camps of the Crossett Lumber Company, situated in the pine woods. In accordance with recommendations, a very small amount of ditching and oiling has resulted in com-

Fig.6.



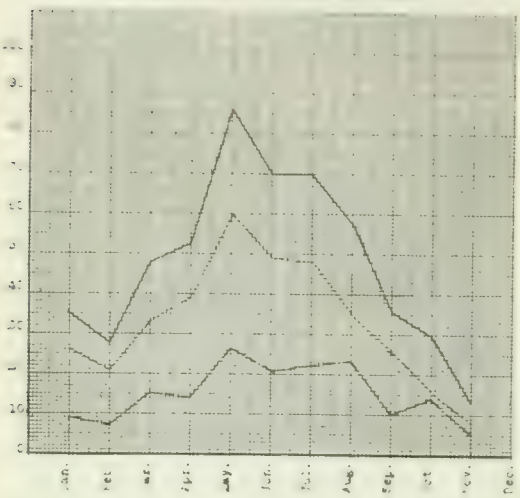
Calls for Malaria, Crossett, Ark. Solid line, 1915. Dotted line, 1916. U. S. Public Health Service.

plete suppression of malaria, which, a few months ago, constituted 75 % of all ill-

Fig. 7.

Monthly Distribution of Reported Cases of Malaria, Crossett, Ark., 1916.

U. S. Public Health Service



Solid line, total cases; dotted line, white cases; broken line, colored cases.

ness; it is now negligible. As these studies are as yet incomplete, the detailed data are not as yet available.

The foregoing summary of activities with reference to malaria is briefly illustrative of the various lines of investigation that are being conducted by the Public Health Service, and some of the results that have been obtained through control operations instituted under its supervision. The services of the staff engaged in these studies are available for consultation to such communities as propose to undertake anti-malarial work, and for such supervision as may be required.

Though the economic losses due to malaria are almost beyond direct computation, the very tangible gains that have followed systematic application of appropriate measures have demonstrated what is possible of achievement. The necessity for further and greater works of education and demonstration, and for continued and extended investigations, is impossible of adequate emphasis; it may be summed up in a quotation taken from a paper of Surgeon von Ezdorf, to whom the writer was deeply indebted and desires to pay his personal tribute: "Malaria in the South Spells 'Destruction'; Its Control, 'Construction.' ".

List of Service Publications with Reference to Malaria

Reprint by Assistant Surgeon-General [illegible] U. S. Center
Supplement No. 18. Malaria [illegible] and Its Cause and Prevention
Reprint No. [illegible] Anti-Malarial Measures for Farm Houses and Plantations
Reprint No. 136. Malaria in North Carolina
Reprint No. 141. "Quinine Preparations for Malaria."
Reprints by Surgeon R. H. von Ezdorf:
Supplement No. 11. What the Farmer Can Do to Prevent Malaria
Reprint from the Journal of the A. M. A., Feb. 7, 1914. Investigations of the Prevalence of Malarial Fevers in the United States by the U. S. P. H. S.
Reprint No. 159. Malarial Index Work. Methods Used in Obtaining Blood, Making Blood Smears and Staining.
Reprint No. 160. Malarial Fevers. Prevalence and Geographic Distribution in Arkansas.
Reprint No. 170, "Prevention of Malaria."
Reprint No. 172, "Malarial Fevers—Prevalence and Geographic Distribution in South Carolina, Georgia and Florida."
Reprint No. 186, "Malarial Fevers—Prevalence and Geographic Distribution in Alabama."
Reprint No. 193. Malarial Fevers. Prevalence and Geographic Distribution in Mississippi.
Reprint No. 272, "Anopheline Surveys."
Reprint No. 277, "Malaria in the United States."
Reprint No. 328, "Demonstration of Malaria Control."
Reprint No. 331, "Endemic Index of Malaria in the United States."
Reprints by Sanitary Engineer J. A. A. LePrince:
Reprint No. 257. "Impounded Waters."
Reprint No. 258, "Malarial Control—Drainage as an Anti-Malarial Measure."
Reprint No. 260, "Malarial Control—Oiling as an Anti-Malarial Measure."
Reprint No. 290, "Anopheles as a Winter Carrier," by Technical Assistant M. E. Mitzmain.
Reprint No. 324, "Anopheles Punctipennis Say."

PROPHYLAXIS IN MENTAL DISEASE*

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Medical science has probably made the greatest progress for the public good in the field of prevention. In no branch of medicine has this been more true than in psychiatry and its allied problem, feeblemindedness. In psychiatry, not only have great advances been made in the methods of examination, classification, care and treatment, but prophylaxis has come to be more and more universally recognized as the only possible solution of the problem of the increasing burden of the insane.

In discussing prophylaxis in mental disorder, it is well first to consider as

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definitely as possible the etiology of insanity. Statements as to the causes of the psychoses are frequently very loosely made, particularly in commitment papers, and it is often some accidental or coincident event, or something which may have rather resulted from the abnormal mental state, that is assigned as the etiological factor. It is quite generally accepted, however, at least in a statistical way, that there are three great fundamental or essential causes upon which, as a basis, insanity may develop, namely: heredity, alcoholism, and syphilis.

Heredity has long been recognized as an important factor in the development of insanity, but it remained for modern psychiatrists, applying the discoveries of Gregor Mendel, the monk, working among his flowers, establishing the so-called Mendelian theory or law of heredity, to state the problem more explicitly. It was found that parents with certain known characteristics or unit traits may be expected to have children a definite proportion of whom will exhibit similar traits. Rosanoff, of the New York State Hospital Service, who has done so much to elucidate the subject of heredity in insanity, has, from investigations of actual family trees, reached quite conclusive findings which seem to coincide with the Mendelian theory. It is yet difficult, of course, to state definitely what is meant by the different unit characters or traits, but at present by heredity is meant not so much an actual inheritance of insanity, but rather a predisposition, an unstable mental make-up or psychopathic constitution. Such persons lack some quality, the absence of which causes them to become upset mentally by circumstances or conditions which a normal person is able to overcome, resist or bear.

The common psychoses as dementia praecox, manic depressive insanity, constitutional inferiority, the psychoneuroses and allied conditions appear to develop upon a basis of heredity in a large proportion of cases where it is possible to obtain complete anamneses.

Alcohol, in a somewhat varying degree, according to the locality being considered, is a real factor in the causation of insanity. In the New York State hospitals, with a total patient population of over 33,000 and an annual admission of about 8,000, alcohol was assigned as the most important etiological factor in over 12 % of cases. But in any locality alcoholic psychoses such as pathological intoxication, delirium tremens, hallucinosis, Korsakoff's psychosis (polyneuritic delirium), alcoholic deterioration, paranoid states and allied conditions, are very infrequent when one considers the multitudes who constantly use alcoholic liquors. As a matter of fact, careful investigation has led to the conclusion that psychoses develop in those who use alcohol because of some inherent constitutional defect or weakness and that alcohol is often only an exciting factor which may simply bring to light a neuropathic state or an actual pre-existing psychosis. Here again one returns to heredity as probably the real basis for many of the alcoholic psychopathic states.

In syphilis, however, is had a real and undoubted casual agent in the various cerebral luetic conditions, the special type, general paralysis of the insane or paresis and in certain cerebral arterio-sclerotic conditions. In the New York State hospitals over 14 % of first admissions were directly traceable to syphilis. The spread of syphilis is closely linked with the evil of prostitution. It is an important consideration that a large percentage of prostitutes are feeble-minded. In this way again, as in the case of alcohol, an intimate — although indirect — relationship is shown to exist between the development of syphilitic psychoses and the problem of heredity.

Without entering into an extended discussion of the question, it seems also as if most, if not all, the psychoses which develop at the critical periods of life, i. e., adolescence, menopause and senility, have as a necessary basis some degree of predisposition or neuropathic constitution.

The limits of this paper will admit only a reference to the contributory, accessory or exciting causes of the psychoses. These are very numerous and many times are perhaps accidental or incidental. Actual injuries to the brain may cause insanity, but this is largely a matter foreign to the present consideration. Infectious diseases, toxic conditions, child-bearing, pellagra—a very prolific cause of admission to the South Carolina State Hospital — and other influences tending to reduce

the general vitality, are frequently associated with insanity as contributory factors. The so-called "mental" and "moral" causes bear a similar relationship, causes such as financial or marital difficulties, deaths of relatives, disappointments of various kinds.

Many if not all of the so-called contributory or exciting causes are experienced by almost every one in general. It can be readily seen, therefore, that it would not be logical or true to consider these alone as sufficient to bring about a psychosis, and it must be the conclusion that a basis of a neuropathic constitution or a natural tendency predisposing toward the development of insanity has existed in these cases.

From the brief and hurried consideration of the etiology of insanity, it has been shown that heredity in the sense of a neuropathic constitution is a most constant element in the development of the psychoses. As a prophylactic aid, therefore, any method of successfully combatting the hereditary influences and their effects must be important.

So far, regulation of marriage so as to rule out the unfit either by a compulsory physical examination or otherwise, and the sterilization of certain classes such as the feeble-minded, have proven to be a disappointment except in a few isolated cases. In some states, laws have been placed upon the statute books with the above in view, but they have simply become dead letters on account of the question of constitutionality. On the other hand, publicity at present seems to be the most practicable prophylactic measure, and popular lectures on marriage, sex hygiene, feeble-mindedness and so forth should prove to be of value in counteracting the marriage of the unfit.

To prevent the increase of the feeble-minded, there is no plan at present more practicable than the segregation, especially of the females, during the child-bearing age. The cost would be large, but not so great as would be the cost of the many descendents of these persons if at large. In order to overcome the objections of parents and friends to segregation, reliance must be placed upon education, the persuasion of social workers, teachers, clergymen, physicians and other influential persons. The attractions of the institution itself and its facilities for recreation and training will do much toward overcoming whatever sentiment there may be against it.

Having neuropathic tendencies quite generally to combat, all popular movements looking toward the betterment of the race, such as "better babies" movements, should be encouraged and advocated. Such agitations afford excellent opportunities not only to start children properly by instructing parents in accepted methods of infant feeding and other details of care, but also in the spread of propaganda in respect to the management of older children. In this age of what many are pleased to call "enlightenment," it often appears that too little heed is paid to the old, but by no means to be discarded, adage, "Spare the rod and spoil the child." At any rate, in the home firmness of decision and discipline must be maintained. Care must be taken, as Barker pointed out, that too much concession to passing likes and dislikes is not made, especially in the case of nervous young girls in whom, if there is no organic trouble as a basis, there should early be instituted a process of psychic hardening. Plenty of outdoor exercise and play in the active association of other children under judicious supervision, especially in the case of the only child, the teaching of self-reliance, respect for the rights of others, the necessity for the control of the emotions and passions, are among the possible influences for good with which children may be surrounded and which may save a child with neuropathic tendencies from developing later into a neurasthenic, psychasthenic or the subject for a psychosis.

Faulty home influences and surroundings may do much toward aggravating an already present neuropathic disposition. In the home, health and right living should be cultivated that a proper environment may be had for the members of the family. The fostering of a correct mental attitude towards life, a tendency toward optimism, the avoidance of worry, suspicion, envy, hate and the like, all of which if exaggerated form strong bases for the development of psychoses, these are all important as measures of prophylaxis and especially necessary where there are neuropathic tendencies.

The government in many ways is becoming more paternalistic and all are growing more and more dependent upon civil authorities for the correct upbringing of the children. The school is thus becoming increasingly important in the care of the health and the development of the character and mentality of the children. It is no longer a matter of debate as to the necessity for medical inspection of school children. The importance of strict medical supervision is well recognized and the elimination of the unfit and the formation of special classes are natural consequences. In this way the mentally defective or neuropathic are early recognized and many of the latter, by special attention, may be helped to such a degree of readjustment that they may become useful and to casual observers, normal members of the community. Greater efforts should be made to individualize education. It must be acknowledged that all are not fitted for the same course of instruction and that the limitations, natural inclinations or aptitude of the individual should, as far as possible, be given due consideration.

School systems should be prepared to apply such tests as the Binet-Simon for mental deficiency and psychological laboratories with those familiar with such investigations should be provided. In this way, it would be possible to avoid the production of many failures in life and consequent worry and psychosis development. The haphazard, ill-advised and guideless selection of courses in school work is alone often responsible for the misfits one sees in various trades and professions — persons who might in their proper and more simple environment or sphere prove to be successful individuals or at least self-maintaining members of society.

Much can be done in a positive way for race betterment by instruction in the schools in the principles of hygiene. The question of teaching to children the various phases of the sexual life is a debatable one, especially as to the practical methods of instruction. Theoretically, children should obtain their information on such subjects in the home, but practically, in the vast majority of cases, such topics are either tabooed or neglected. Some instruction is necessary and advice should be available, especially for those who are in the critical period of adolescence or early sex activity and longing. In many cases the family physician can exert the greatest influence for good and has the best opportunity for confidential discussions of such matters. Repression of difficulties or unfortunate experiences and brooding at this period may result later in psychotic disturbances, whereas free discussion and explanation may entirely remove this danger.

As the pupil becomes older and mature, the discussion of the hygiene and mysteries of the sex life should be continued. The dangers of promiscuous sexual activity, the virtue and possibility of continence, the menace of disease and its far-reaching consequences must be indelibly impressed. That this is a difficult task and one to be intrusted only to selected and qualified instructors is acknowledged, but this should not deter nor excuse educational authorities from assuming the responsibility.

Such instruction, together with the early and constant teaching of the necessity for bodily purity in the male and the inculcation of chivalry and respect for womanhood, should accomplish much toward the elimination of the menace of venereal disease. A growing interest in athletics, with the training incidental thereto, should help in the formation of habits of right living, and will often appeal to the individual when the purely moral aspect of the question, which should by no means be neglected, will fail.

Criminalogists are coming to recognize more and more the close relationship between insanity or mental defect and crime. The recent movement to establish psychologic and psychiatric investigators in prisons and as adjunct court officers illustrates the modern tendency in this direction. Habitual criminals and the members of their families may be eliminated as defectives and by segregation removed as further producers of their kind, or perhaps by treatment and correction of environment made less dangerous or even useful citizens.

One frequently hears of the "ever-widening influence of psychiatry." No longer can institutions for the insane and the officers connected with them restrict their activities to the small sphere of the

"asylum" as formerly designated. The facilities for advice, observation and treatment must be extended by the establishment of out-patient departments in the large centers of population and psychiatric wards in general hospitals. In this way, as is shown by actual experience, thousands of persons may be reached and benefited in the early and borderline stages of psychosis development and restored to mental health in a short time, avoiding what is now so often wrongfully considered the stigma of commitment in a hospital for the insane. The frequently unwieldy, slow and public methods of commitment procedures, often treating a prospective patient as a criminal, incarcerating him in a jail, escorting him to the hospital, it may be handcuffed in the custody of an officer, must be substituted, so far as possible without endangering his constitutional rights, by prompt and expert examination, care of trained attendants, and quick and unobtrusive method of conducting to the hospital for treatment. The system of voluntary admission must be extended, bringing within reach of many patients, who themselves often realize the necessity for treatment, the early care that insures a brief residence at the hospital. Such facilities are not only of great benefit to the patient, but are really a matter of economy to the state, shortening the length of care in the hospital, consequently lessening the expense and, it may be, restoring sooner a useful member to the community.

Through a system of parole of suitable patients by reason of improvement or recovery, an opportunity may be given for the trial return to self-support for a period of some months, during which time the patient may return to the hospital for further care and treatment without a repetition of the legal formalities should it be deemed necessary. The parole system should be combined with an efficient after-care agency, preferably a member of the medical staff or a social worker, who may have a certain amount of supervision over the paroled patient. Such an after-care worker may render service in advising the return of the patient if indicated in assisting in a change of habits or environment, in helping to obtain a suitable position, in arousing a kindly, helpful attitude toward the former patient, in combatting the feeling of suspicion or lack of confidence so often met with, and in adjusting various difficulties in the home, family or environment which might otherwise cause a return of the psychosis. In other words, the state hospital should be the centre of advice for mental health, an active rather than a passive agency for good.

Considering the question of prophylaxis in mental disorders from the standpoint of the public at large, the possibilities of bettering the general situation are numerous. The movement for temperance and prohibition which has been growing with such surprising rapidity should do much toward eliminating alcoholic excesses and resultant psychotic disturbances. Radical legislation is needed upon the question of syphilis. It might be made a reportable disease and thorough treatment compulsory under supervision of civil health authorities. Community, institutional and other Wassermann surveys with prompt treatment of those indicated can not be conducted too often. The question of prostitution, so closely connected, is too broad and difficult for present discussion, but certainly regulation is necessary. As mentioned before, probably in the education of the public lies one of the strongest hopes for future mental betterment. If possible, the young adult should be led to see that there are other considerations than so-called love—so often propinquity—in the question of selecting a mate and the dangers of bad heredity emphasized. Popular lectures should be offered the public giving the causes of insanity, ways of prevention, proper modes of living and healthy attitudes toward the world, general and personal hygiene, and so forth. The public should be informed that many varieties of insanity are curable and that it is not true that "once insane always insane." In behalf of the improved or recovered patient, the public should be taught a sympathetic and helping attitude. The fact should also be published that the possession of a neuropathic constitution or insane heredity does not necessarily mean the development at some time of a psychosis and that the latter may be avoided through the safeguards

of proper mental attitude, environment and general hygiene.

In view of the importance of the early recognition and treatment of insanity, more attention should be paid to the study of psychiatry in the medical schools. The state hospitals, by throwing open the staff meetings to the general practitioner, may also become valuable centers of instruction in a practical way.

One of the most active agencies in promoting prophylaxis in mental disease is the "National Committee for Mental Hygiene." Started as the result of the efforts of the author of "The Mind That Found Itself" to ameliorate the conditions of the insane and to improve the methods of care and treatment, this movement has grown to the most widespread endeavor for the prevention of insanity. By providing competent speakers for public meetings, the preparation and distribution of pamphlets, designed to inform the public as to mental disease, its causes, preventableness, what is done in hospitals and other data which would be of interest to the public, by the formation of local societies of mental hygiene, by the making of surveys, by the furnishing of advice — in these and countless other ways does the committee do much for prevention.

In conclusion, prophylaxis in mental disease would seem to be the most important measure in the solution of the problem of the increasing burden of the insane.

From the standpoint of the etiology of insanity, heredity, alcohol and syphilis are the most frequent factors, while in any case heredity in the sense of a neuropathic constitution would seem to be most constant.

As preventive measures, regulation of marriage and sterilization have so far been impracticable. Segregation of the feeble-minded, however, should be resorted to, especially in the case of females during the child-bearing period. "Better babies" movements and other propaganda designed for race betterment should be encouraged.

In the home, discipline and firmness of decision in dealing with the child should be maintained. Outdoor exercise and active association with other children should be encouraged. Proper home influences and environment should be provided and a correct attitude toward life taught to the children.

In the school, medical inspection with provision for special classes, individualization of education, equipment for mental deficiency tests and psychologic investigations, guidance in selection of courses and life work, instruction in the principles of hygiene, including the sex question, with guarding against repression or brooding, all are important.

In the court, the recent movement to have as adjunct officers those qualified to make psychiatric and psychologic investigations will add to prophylaxis in mental disorder.

In the hospitals, the "widening influence" as exemplified by out-patient departments and psychiatric wards in general hospitals tends toward prevention. The importance of a prompt and unobtrusive method of commitment, of voluntary admissions, of the extension of the parole system and of after-care agencies should all be recognized.

In respect to the public at large, all temperance or prohibition movements are prophylactic aids.

Some form of legislation against syphilis is indicated. Wassermann surveys with subsequent treatment of those who require it are important. Some kind of regulation of prostitution should be instituted.

Probably the greatest general benefit at present is to be derived by educating the public. More thorough training in psychiatry should be given in the medical schools and the general practitioner would do well to take advantage of any opportunity he may have of gaining practical knowledge such as attending hospital staff meetings.

Valuable information upon the various phases of the question of insanity may be obtained from the "National Committee for Mental Hygiene," which is a most active agency for promoting prophylaxis in mental disease.

SURGERY, GYNECOLOGY, OBSTETRICS AND GENITO-URINARY DISEASES

CHYLOUS CYSTS OF THE MESENTERY—CASE REPORT*

By H. R. Shands, M.D., F.A.C.S.,
Jackson, Miss.

Chylous cysts of the mesentery constitute a distinct clinical entity, which occurs at such infrequent intervals that we are probably justified in devoting a few minutes to a review of its main characteristics and to the report of an unpublished case.

Rokitansky is credited with first having given an accurate description of this disease. He made his observations, in 1842, from the study of an autopsy case.

It is stated that Tait did not observe this condition in two thousand laparotomies.

There have been reported to date approximately 200 mesenteric cysts, considerably less than half of this number being chylous. Carson, in 1889, reported the first case in America.

Monyhan classifies mesenteric cysts into serous, chylous, hemorrhagic, dermoid and malignant degenerations.

As to the etiology, there is some difference of opinion. Dowd says: "Taking these cysts together, it seems pretty well established that the chylous cysts are preformed cysts situated in such close relation to the lacteals that chyle has been effused into them, and that they are really of embryonic origin, in structure similar to ovarian and par-ovarian cysts." Most other observers think the cause of this trouble to be a degeneration of the lymphatic gland, the efferent vessel being closed and thus forming a retention cyst. Many cases indicate that in some way trauma is responsible for their development.

True chylous cysts do not have an epithelial lining and they seem to be formed from dilated and ruptured lymphatic vessels.

If the disease has any characteristic symptom it is the presence of a cystic abdominal tumor centrally located and possessing an unusual degree of mobility. The presence of the tumor and the secondary inflammation that sometimes occurs may cause symptoms of partial or complete obstruction, with pain, vomiting, etc. In complicated cases often a history of recurring attacks simulating volvulus may be obtained. Most often the diagnosis has not been made before operation and the indication for operation has been for the removal of an abdominal tumor or for the relief of a partial or complete intestinal obstruction.

The tumor grows between the two leaves of the mesentery and may contain from a few drachms to a quart or more of fluid. Obstruction of the bowel may be caused by pressure on the affected portion of the bowel, by volvulus or incarceration of the pelvis.

The treatment is, of course, surgical, and any one of three procedures may be advisable. In some cases the sac may be safely enucleated without interfering with the blood supply of the bowel, and of course this is the ideal procedure. The bowel may have become strangulated through twisting or pressure, and then resection of the affected bowel will be necessary. As might be expected, the mortality after this procedure has been higher than in cases treated by the other method. It will sometimes be best to suture the cyst wall to the peritoneum and provide drainage. The resulting sinus will usually close permanently in from seven to twelve weeks. Results from this form of treatment have been surprisingly good.

In the case observed by myself the cyst was readily uneucleated.

AUTHOR'S CASE

Miss P. T., aged 20, was seen in June, 1916. The family history was negative. The patient had been operated upon for a severe acute appendicitis six years previously. No complications followed this operation. Her complaint when seen in June was of a lump in the abdomen. She had observed this enlargement for two months, but it had given her very few symptoms and she had not attached much im-

*Read in Section on Surgery, Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916.

portance to it. She only came for examination because she was advised to do so after her mother had asked to have medicine sent down to remove the lump.

At examination a cystic tumor the size of a cocoanut was found to the left of the umbilicus. The patient stated that at night the lump disappeared under the ribs on the left side. The tumor had an easy range of motion from high up in the left hypochondriac to the right iliac region. In fact, the only regions in the abdomen in which the tumor could not be placed were the upper right lumbar and right hypochondriac regions. It was at first thought that the tumor might be a very movable hydro-nephrotic kidney. However, the range of motion was too great and the urine was normal. An X-ray picture with the right kidney pelvis injected with cargentos and the tumor held over the sacral promontory demonstrated the kidney to be normally located.

A diagnosis was made of mesenteric, omental, or ovarian cysts. Omental cysts are generally inflammatory and should not have such a wide range of motion. The range of motion was also thought to be far too great for an ovarian cyst.

An incision was made through the left rectus and the tumor brought into the wound. The tumor was found to be located between the leaves of the mesentery in the lower jejunal region of the bowel. It contained one pint of milky cream-colored fluid. An attempt was made to enucleate the cyst without rupturing it. This, however, proved to be impossible on account of the extreme thinness and friability of the sac. So the fluid was allowed to escape outside the cavity and the sac was then quite easily removed without injury to the blood supply of the intestine. The rent in the mesentery was sutured and the abdomen closed without drainage. The patient developed no complications and went home in one week, remaining in bed a few days after reaching home. She developed no subsefuent trouble of any kind and is now well.

On examination the fluid exhibited the characteristics of chyle. The sac was not examined microscopically.

DISCUSSION

Dr. J. G. Gaither, Hopkinsville, Ky.—Chylous mesenteric cysts are interesting to me because I recently saw a case. There seem to be but few reported in the literature, so it was with pleasure that I saw that Dr. Shands was to present a paper on this subject.

I was sent a specimen of the fluid, which had been drawn from an abdomen by tapping, to pass upon it, and upon examination found "butter-fat." The patient was an inmate of the insane asylum near the town in which I resided and died shortly afterward. There was a mesenteric cyst of enormous proportions. The cyst wall itself was very thick and tenacious, being intimately adherent to all the structures of the lower abdomen. There was no opening at all from any point in which we could find where the chyle had poured into the cyst,—evidently being an obstruction of the pyloric bowel. The patient had been in the asylum for eighteen years and seemed to have developed the cyst during the last year of her life.

Dr. Rudolph Matas, New Orleans, La.—A word as to the parasitic origin of these cysts. From the earliest years of my practice in New Orleans I have been on the lookout for filariasis as a possible semi-tropical complication of chylous cysts and other lymphatic effusions such as chyluria, elephantiasis, etc. In over 35 years I have only seen one case of filariasis of the human type (filaria sanguinis hominis) in the fluid from a chylocele in which the parasite was clearly demonstrable in the blood. This occurred in a young Cuban who had evidently been infected in the West Indies. He recovered apparently after a long sojourn in Colorado. This case was reported by Dr. A. McShane and myself in the *New Orleans Medical and Surgical Journal* of January, 1891. The great rarity of the filaria sanguinis hominis in the Southern and Gulf states is remarkable when the great frequency of filariasis in the dog (filaria immitis) is considered. A considerable percentage of our laboratory dogs die of this type of parasitism, the parent nematodes causing fatal cardiac lesions after a chronic anasarca and other heart disturbances. This is also the experience of the observers in the South, as shown by the admirable report of a case of parasitic chylocele published by Dr. Wm. Mastin, of Mobile, in 1888. The only exception, to my knowledge, is in Charleston, where Dr. John Guiteras first reported the presence of the parasite in that city, in 1886, and Dr. de Saussure, who, in 1890, reported 22 cases of various filarial manifestations in man observed from 1886 to 1890 in that city. I have seen a considerable number of cases of chyluria, chylous cysts, chylothorax, chylous ascites and elephantiasis; but apart from the case previously mentioned, I have not seen a single native case occurring in a permanent resident of New Orleans since my first case was observed in 1891, and that occurred in a foreigner. Why this relative immunity exists among the people in our latitudes is not clear to me. I am also curious to know why we have heard so little from Charleston in this respect since the publications of Guiteras and de Saussure in the eighties. I am quite confident that Dr. Shands' case is not of parasitic origin, but owes its etiology to a different pathology.

I do not doubt that filariasis does occur in the South, but it is extremely rare, and yet the types of lymph edema and lymphatic obstruction, such as elephantiasis and chyluria, are quite frequent in our clinics. In all such cases a systematic examination of the blood is always made for filarial types both of the nocturnal and diurnal species, but always with negative results.

Dr. Kenneth M. Lynch, Charleston, S. C.—I would like to ask Dr. Shands if this patient's blood was examined. We have these chylous cysts in Charleston not infrequently. Our patients have microfilia in their blood. As a matter of fact, the adult worm has been found obstructing some cases like this. In the South the patient's blood should be examined for microfilia, and if they are found the diagnosis should be pretty clear.

Dr. E. G. Jones, Atlanta, Ga.—The extreme rarity of mesenteric cysts makes the subject always interesting. I have found three of these

cysts in the same individual in the mesentery of the transverse colon, the most outward of which was near the hepatic flexure. All could be enucleated without any great difficulty. In another patient a single cyst was found in the sac of a very large hernia and was enucleated safely. A third patient, a child, with symptoms of obstruction presented what appeared to be a chylous cyst of the mesentery, but an examination of the contents did not sustain the belief that it was chylous.

A very careful examination was made of the contents of all these cysts in all three individuals, as well as the cyst wall in all cases, without any light's being shed upon their origin. Of course, this is the interesting point in reference to them, and in case of an individual who has a mesenteric cyst which is not lined with epithelial cells, it can not be said that that cyst was never lined with epithelial cells, because they may have been destroyed by pressure or inflammation.

Dr. Shands (*closing*).—We have not been making a special examination for microfilia, but shall do so in the next suspected case.

NEW GROWTHS OF THE CLITORIS*

By W. W. Battey, Jr., M.D.,
Augusta, Ga.

The clitoris may be the site of benign or malignant growths. During the past twelve years twenty-three cases have been reported in this country and abroad. The history of some of these discloses the fact that many sufferers from this trouble are very indifferent about consulting a physician early and it is only when the annoying and constant symptom of pruritus vulvae becomes almost unbearable do they present themselves for treatment.

The etiology of these growths is unknown. It is probable that the theory of irritation is the most likely one.

The symptoms are variable and depend upon the duration, size and condition of the growth. Painful micturition, hemorrhage due to ulceration, painful coitus, discharge of fetid odor and intolerable itching of the vulva are all symptoms, but all do not necessarily exist in every case, except the symptom of intolerable itching which usually does.

The treatment of this condition is operative. In the benign growths the simple removal of the tumor will suffice, but in the malignant types the removal of the tumor and the superficial and deep lymphatic nodes are imperative. There may be no evidence of palpable glandular involvement at time of operation, but this should not deter us from making a thorough dissection of lymphatics.

LYMPHATICS

Basset, in *Review of Surgery*, Paris, 1912, describes elaborately his dissection of the inguinal lymphatics on the cadaver and endeavors to show why recurrence is so likely to occur after removal of the superficial nodes only, and suggests, as

Fig. I.
Growth before operation

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a remedy, the removal of both superficial and deep nodes. His description of the nodes and lymphatics of this region follows:

The lymphatics of the prepuce go to the inguinal superficial glands. The lymphatics of the clitoris have many branches. They pass from the dorsum of the clitoris and go to the symphysis, where they form a network in which small glands are to be found, from which depart lymphatic trunks which go in general to the glands of the same side, but often to the other side of the body, which is of great importance from a surgical viewpoint. From this plexus depart two orders of collectors. One

Fig. II.
Six months after operation

of these vessels goes into the inguinal canal with the round ligament and below it. It ends in the retrocrural external gland. Other trunks go directly outside the canal as do the lymphatics of the prepuce, and with them reach the root of the hip in passing transversely before, or in front of, the middle adductor muscle near its pubic origin. It terminates in the deep inguinal glands and in the retrocrural internal gland.

Surgically there exist four lymphatic trunks leaving the clitoris, two on either side, as follows:

One trunk may be called the round ligament trunk. It follows the round ligament in its inguinal journey and arrives at the most anterior and most external of the glands situated outside the external iliac artery, the retrocrural external gland.

The inferior trunk reaches first directly outside the superficial inguinal glands and the crural glands situated within the femoral vein; and then going alongside the vein it reaches the retrocrural internal gland. It is this last and the round ligament trunk which have always seemed to constitute the most important element of this gland collection.

TECHNIC OF THE OPERATION

An oblique incision of both inguinal regions is made parallel with Poupart's ligament, beginning about two inches below the anterior superior spine of the ilium. These incisions are connected by a transverse incision on a line with the symphysis pubis. The oblique incisions are continued downward about one-half an inch to the outside of the labia majora and are connected by a transverse incision just above the meatus. The superficial glands and lymphatics are removed. The aponeurosis of the external oblique is laid open widely. The round ligament is dissected out of the canal and held taut by a retractor. The conjoined tendon of the internal oblique and transversalis is retracted upward, this exposing the iliac and allowing a dissection of the retrocrural external gland.

The outer surface of the external oblique aponeurosis is dissected free and drawn well to the upper lip of the incision. At a point just below where the vessels emerge from beneath Poupart's ligament the aponeurosis is divided and retracted above and below, exposing the iliac artery and vein. The deep epigastric artery and vein are tied and the retrocrural internal gland dissected out from its attachment to the iliac vein.

The round ligament is then divided at the internal ring. The ligament, lymphatics and glands are removed en masse, including part of the labia, majora and minora, and the clitoris. The structures

are closed with drainage beneath the aponeurosis.

The following cases (see table on next page) have been collected from the literature and are presented in tabulated form. To this number have been added two cases which have not as yet been reported. One case is that of Dr. Chas. W. Crane and another of the late Dr. George A. Wilcox, Augusta, Ga.

MORTALITY

Unfortunately the final result in many cases is not given; so it is impossible accurately to arrive at the percentage of cures and deaths. The mortality rate is about 40.7% in this collection, though it might be considerably higher if the final result were known in six cases of this series.

THE AUTHOR'S CASE

Recently there came under the writer's observation a case operated upon by him, the report of which it is desired to give in detail.

Mrs. M., age 70. Menstruation began at 14. Always regular. Has had two children. No "female trouble." Past history negative.

Present History.—About one year ago she developed an intense itching of the vulva. Owing to the fact that her eyesight was very bad, she did not notice the existence of a growth of the clitoris. Just prior to the time of seeking medical advice she noticed a blood stain upon her clothing, suggesting the presence of something abnormal.

Examination.—Vulval examination revealed the presence of an irregularly shaped, ulcerated growth of the clitoris about the size of a pecan. No involvement of the labia. No palpable inguinal glands.

Operation.—Wide excision of the growth down to the periosteum of the pubic bone. Wound closed with drainage. The inguinal glands were not removed.

Pathological report was made by Dr. E. A. Wilcox, Augusta, Ga.—Mrs. M. A., resilient homogeneous cellular tumor, irregularly round and nodular, limited externally by a squamous epithelial membrane and internally by a fibrous membrane, which permitted enucleation. Microscopically, the cells are round, oval and sometimes elongated. Long cordons of cells constitute the most striking feature. These cordons are often composed of a single line of cells; but more frequently the column is doubled or even tripled. A connective tissue stroma parallels these columns, but nowhere does the stroma become intercellular. The columns are mostly solid, but in many places a tubular or capillary structure is seen, especially in cross section. The tumor cells are lepidic, and have little resemblance to epithelium in its usual state of neoplasia. It is impossible to be certain of the nature of the tumor, but the lymph endothelium appears the most likely origin.

Diagnosis.—Lymphendothelioma.

The specimens presented are from the Pathological Laboratory of the University of Georgia, and I am indebted to Dr. E. A. Wilcox for his kindness in allowing me to show them.

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DISCUSSION

Dr. W. S. Goldsmith, Atlanta, Ga.—I have seen five cases of abnormal growths about the clitoris, two of which were in white women, involving not only the clitoris but the vulva as well. These cases were so advanced that no attempt at operation was made.

In getting the history, both gave the history that the growth of the lesion was primarily in the clitoris.

The third case, also in a white woman, was a hypertrophic elongation of the clitoris in a woman about 28 years of age. Her husband had left her. The enucleation of the clitoris was advised, and she declined the operation.

The other two cases were in Negro women,—two large growths,—and these tumors we sought to reduce on account of their large, bell-clapper-like pendulous nature. We simply cut off the small neck or pedicle which suspended this large bell-clapper tumor.

Neither of those cases was examined, but I feel sure that they were not malignant in character.

Dr. E. C. Davis, Atlanta, Ga.—I have never seen a neoplasm, in my own experience, originating in the clitoris. No tissue has been more filled with superstition or perhaps of interest than this, and I confess that in my experience I have only seen the conditions of hypertrophy, irritation and similar conditions. The one of hypertrophy declined to submit to operation and passed from under my observation.

Name	Age	Color	Duration	Variety Growth	Involved Gland	Treatment	Result
Veal	[illegible]	[illegible]	[illegible]	Melanotic Sarcoma	Yes	Removal	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	Spindle Cell Sarcoma	Yes	Removal	[illegible]
M[illegible]	[illegible]	[illegible]	3 years	Melanotic Sarcoma	No. Labia, inguinal	[illegible]	[illegible]
M[illegible]	[illegible]	[illegible]	[illegible]	Melanotic Sarcoma	Yes. Labia, inguinal and median	No treatment	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	Epithelioma	[illegible]	Complete	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	Epithelioma	Yes	Removal	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	Spindle Cell Sarcoma	Yes	Removal	[illegible]
[illegible]	[illegible]	[illegible]	18 months	Round Cell Sarcoma	Yes. Mineral and inguinal	Removal	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	Melanotic Sarcoma	Yes. Labia, mineral	Removal growth, glands and part of urethra	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Removal	[illegible]
[illegible]	[illegible]	[illegible]	6 months	Epithelioma	Yes	Removal	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	Epithelioma	Don't know	Removal	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	Melanotic Sarcoma	Yes	No record	[illegible]
M[illegible]	[illegible]	[illegible]	[illegible]	No report	Yes	Removal	[illegible]
[illegible]	[illegible]	[illegible]	1 year	No report	No glands	Removal	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	Epithelioma	No glands	Removal	[illegible]
[illegible]	[illegible]	[illegible]	6 months	No report	Yes. Both regions	Removal	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	Melanotic Sarcoma	No	Removal growth	[illegible]
[illegible]	[illegible]	[illegible]	5 years	[illegible]	[illegible]	Removal growth	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	Epithelioma Clitoris	No	Removal growth	[illegible]
[illegible]	[illegible]	[illegible]	3 months	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	Epithelioma Clitoris	[illegible]	Removal growth	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	Epithelioma Clitoris	No	Removal growth & [illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Removal	[illegible]
[illegible]	[illegible]	[illegible]	2 months	Epithelioma	Yes	Removal	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	Fibroma (soft)	[illegible]	Removal growth	[illegible]

RADIUM THERAPY*

By E. C. Samuel, M.D.,
Radiotherapeutist, Radium Institute,
New Orleans, La.

We are living in an age of marvelous achievement in certain branches of the arts, and when we consider the hopelessness of some conditions, we are ready to accept, on trial, almost any new thing that makes its appearance on the horizon. Among these comparatively new forms of treatment, I wish to call your attention today to radium. The name is associated in the mind of the general public with cancer. At times it is really difficult to convince a patient with a fibroid or other benign condition that she has no malignant growth if radium treatment is suggested. Whenever a small quantity of radium makes its appearance in a town the newspapers herald its arrival and engender false hopes among the victims of the terrible disease.

We all know from experience with the Roentgen ray that small doses will often stimulate the growth and cause the tumor cells to multiply rapidly. In referring a patient to the radiotherapeutist for radium application, find out what quantity the doctor has and proposes to use. For general deep work we do not attempt treatment with less than 50 milligrams of the element. For superficial radiation we use the one-quarter strength plaque containing ten milligrams of the element.

The technique of the application of radium is much more complicated than the Roentgen ray, because each patient manifests a varying susceptibility and requires different means of protection from the harmful effects of the alpha and beta ray. We encounter patients that have a marked idiosyncrasy to any form of radiation, and one never knows when trouble is coming. I recently saw a patient with a very severe burn of the tongue. She was referred for a small growth in the hard palate. We used in this case 25 milligrams of radium element, filtered with 3 mm. of brass and covered with one roll of rubber and adhesive plaster on top, which was held in position by a specially devised applicator. It was impossible to protect the tongue by any lead plates, as the secondary radiation from the lead would be much more severe. The application lasted three hours, and at the end of ten days the patient developed a deep burn of the tongue which up to the writing of this paper is not well. She is able to eat soft food only, and will probably be some time before the lesion is entirely healed. There is no way in the world that this occurrence could have been prevented or foretold because the patient had an idiosyncrasy to radium application.

I shall not attempt in this paper to draw any conclusions as to our ultimate results with malignant growths, as the time is too short since our radium has been in use to say anything definite and conclusive. However, we see cases constantly, especially of cancer of the cervix and the body of the uterus, that appear hopeless, which after about three heavy doses show an improvement. You must then consider that you have a powerful means at your command. At first the patient notices that the pain is entirely gone. The discharge is less and has lost its fetor, and usually after the second treatment the hemorrhage ceases entirely. We do not consider these cases by any means cured, but we surely have accomplished much with very little inconvenience to the patient, and without the risk to life which formerly accompanied the use of the cautery and curette.

One of our early patients, the youngest on our record, 28 years old, with carcinoma of the uterus, who presented herself was referred from the service of Dr. Wm. Kohlmann, who diagnosed: "A cancer of the uterus, with infiltration in the broad ligament." The uterus was firmly bound down. The patient's hemoglobin was down to 40 %. There was a foul discharge and considerable hemorrhage. The thigh was flexed upon the abdomen and the patient presented all signs of a terminal sepsis. The patient was referred to me as practically a hopeless case. After the second radiation there was a marked improvement. We continued our treatment until she had received six exposures in all. Examination by Dr. Kohlmann at this time found her considerably improved. The infiltration had practically disappeared. The uterus was freely movable

*Read in Section on Surgery, Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916.

and the discharge and hemorrhage had stopped. About one week or ten days later the patient developed a septic diarrhea, gradually grew worse, and died. Autopsy was refused.

Another case referred for cancer of the cervix by Dr. Rudolph Matas in all received five treatments. On her last visit here Dr. Matas examined her and found the growth was apparently clinically well. We could repeat quite a few histories of this kind, but the tables that will be published with this paper will carry their own explanations.

In young women with a chronic metritis, and the severe bleeding that sometimes accompanies it, radium acts almost as a specific, checking the hemorrhage and making the patient's life bearable.

The uterus itself will stand enormous doses when the radium is firmly held within the cervical canal. As in fibroid of the uterus, I have often applied 75 milligrams for twenty-four hours. These patients generally do not require more than two or three exposures to check the hemorrhage, and cause a reduction in the size of the growth.

A thin watery discharge from the uterus comes on within ten days after the radium application has been made. This disturbs some patients considerably, but it gradually subsides and rarely occurs after the first exposure. Intense nausea occurs in about 75 % of our patients during the application of the radium. It generally comes on about six hours after the radium has been applied. Some cases develop it earlier. One patient within one hour after it was applied developed nausea. This keeps up until the radium is removed and then gradually subsides within one hour and a half or two hours after its removal.

There is one patient in the service of Dr. Matas with a fibroid that had to be treated in the hospital for two days after the application for the constant nausea. Usual stomach sedatives are of no avail. Time, however, brings relief. There is no explanation that we know of for this distressing condition. The theory was advanced that it was probably a liberation of some toxic material from the breaking down of the cells. Up to date, there is no satisfactory explanation available.

Deep Roentgen therapy should always follow the use of radium whenever possible. Adequate screening of the tube is very necessary to get rid of the alpha and beta rays given off by the tube. We are using in New Orleans a Gaus apparatus with water-cooled tubes, giving a penetration of no less than 8 on the Bauer scale. The Coolidge tube we are also using, activated by a 10 KW. Snook generator. I fear we expect a little too much of the Coolidge tube. There is no doubt that it is a wonderfully efficient instrument, but it is absolutely impossible entirely to do away with the secondary radiation from the lead and other metallic substances upon which the soft and hard rays of the Coolidge tube impinge. These secondary rays must be considered in screening for the exposure. I do not mean to discredit the use of the Coolidge tube, but only to call attention to the dangers accompanying its use unless most carefully screened.

I have especially to emphasize that X-ray should follow the use of radium and not precede it, because experience has shown us that the tissue is very much more susceptible to the harmful effects of radium rays after X-ray has been applied. Often radium and Roentgen treatment supplement each other. There are conditions where radium treatment is indicated, and conditions in which Roentgen ray alone is indicated. For small superficial epithelioma, radium plaque is almost a specific, and one or two applications generally suffice to clear them up. For very large areas Roentgen treatment should follow that of radium.

The blood diseases so far are much more amenable to deep X-ray therapy than to radium for the reason that we are able to cover a larger surface than we can any other way. There has been some marked benefits from the radium therapy, but I do not think that we are able as yet to say that we can accomplish so much as we do with the Roentgen ray.

TECHNIQUE

For vaginal work the patient must be prepared thoroughly, just as for operative interference. The same rules of asepsis as in the operating room apply here. In our first treatment for carcinoma of the cervix we generally give a 12-hour exposure with 100 milligrams of the radium element, protected with 3 mm. of brass, this in turn being covered with para-rubber of 1 mm. thickness. We place the con-

tainer directly against the mass and hold this in position by packing the entire vagina out with iodoform gauze. The bladder is emptied before the packing is put in, and after the patient has returned to bed she is not allowed to get up until the radium has been removed. We fasten the tube with a silk ligature about 12 inches long to the outside of the skin and the nurse, who is especially trained for this work, watches the patient throughout the entire exposure. For the second exposure of carcinoma of the cervix and uterus, we use 100 milligrams of the element with 2 mm. of brass screen and two or three layers of gauze. On top of this is employed one turn of para-rubber 1 mm. of thickness. This is left in position generally for 12 hours. The length of time elapsing between the exposures is generally eight or ten days. We have to be very careful of the bladder to avoid a slough, with the resulting vesical-vaginal fistula. It is worthy of note that large doses of radium are being advocated for the closure of these fistulæ, due to the contraction of scar tissue, thereby closing the opening. After three treatments the patient is generally allowed to return home, and is asked to return in six weeks' time for re-examination and further treatment if necessary. For treatment of recurrence in the breast, whenever possible, we have buried the radium tubes without any means of protection directly in the mass, arranging them so that we get the cross-fire method. This technique holds good for any mass that we want to give the entire force from the alpha, beta and gamma rays. A very severe reaction follows it, and great care of the time the radium is left in position is necessary, so as to prevent an actual breaking down of the tissues. The effect is just as severe as the actual cautery.

For all skin conditions, especially of the superficial epithelium, we use 10 milligrams in the radium plaque, screened with one, two or three mm. of brass, covered with para-rubber 1 mm. of thickness, the thickness of the brass screen depending upon the depth of the condition to be treated and the length of exposure. Where we do not bury the radium in the mass it is generally protected with two or three mm. of brass, and we use the distance filtration method. That is of keeping the radium at least two inches from the skin by interposing layers of gauze.

There are other conditions that we must mention as to the result of radium. Vascular nevi in children are very amenable to treatment when not too extensive. The treatment requires a good deal of patience and we should proceed very carefully because the resulting cure is at times worse than the original disease, such as telangiectasis of the skin.

Keloid.—I do not hesitate to say that we have almost a specific in radium, in the results that we get in the treatment of these distressing conditions. The same technique that applies to other skin conditions we use here.

Our results in the treatment of sarcoma are not so promising. In purpose I have said very little in this paper about it, as I hope, as I mentioned before, to bring in a fuller report next year.

There has been a lot of criticism against radium throughout this country, and I shall ask you to withhold judgment for the next two or three years, and by that time I think we shall know exactly where we stand in regard to radium therapy.

In conclusion, I wish to thank Dr. Robert Abbe, of New York, and Dr. Henry Schmitz, of Chicago, for their suggestions and kindness to me while on a visit to their clinics.

DISCUSSION

Dr. W. C. Gewin, Birmingham, Ala.—I know of no one who has had much experience with radium who claims that it supplants surgery in the treatment of malignant and some other conditions for which it is used. Instead, it is often best used in conjunction with surgery, both pre-operatively and post-operatively.

In the treatment of epitheliomata, especially of the basal-cell type, and in uterine hemorrhage from small fibroids and other non-malignant conditions, our results have been highly satisfactory. Also, it is surprising how rapidly some cases of endometritis clear up under radium treatment that have been extremely refractory to other forms of treatment.

As an example of one type of condition in which it would seem that radium is the most satisfactory agent at our command, I shall mention briefly a case that came for treatment from Winchester, Tenn. This man had an extensive carcinoma of the entire lower lip and of practically all the tissues of the right side of the mouth and buccal surface of the cheek. He had been treated by various methods, including pastes and ionization, but in spite of all treatment the growth gradually spread and destroyed the tissues. After two applications of radium the

growth become smaller gradually, but was not entirely well until after the expiration of about three months from the time the first treatment was given. It has been several months since it healed up and at present there is no evidence of recurrence. In this case, because of the locality and the extensiveness of the growth, surgery was not to be considered. Also it was impossible to cover the entire area, or even a large part of it, with the X-rays because of the inaccessibility of the growth.

Illustrative of another type of condition in which the use of radium appeals to me as being singularly appropriate and an ideal agent, I shall mention another case of mine. A woman, 42 years old, had been bleeding profusely at intervals for several weeks and upon examination was found to have a small fibroid. A bad heart rendered the administration of an anesthetic very unsafe and an operation impracticable. After two treatments of twelve hours each with 50 mg. of radium element applied directly in the uterus, the symptoms subsided, and there has been no return as yet. It has been about eight months since she was treated.

The greatest essential in using any therapeutic agent is a correct understanding of both its potentialities and its limitations, and how best to combine it with other recognized methods of treatment. Radium and X-ray therapy is a broad field within itself, and in order to obtain the best results it is essential that its administration, and the selection of cases for treatment, be supervised by a man giving his time and thought to this particular work. Dr. Weed treated the cases referred to, and in fact gives all radium and X-ray treatments at the Birmingham Infirmary. He reports a series of cases similar to the ones mentioned with gratifying results. He has been able to produce an artificial menopause in all cases desired, with one or two applications of radium directly into the uterus. Also, in two cases that I recall of my own of young women he was able to control the menorrhagia without producing a complete menopause.

Of course there are contra-indications to its use, and there are cases of malignancy, as well as other conditions, in which its use will be disappointing and unsatisfactory, but this can, possibly, be said of practically all therapeutic agents and measures. Applied intelligently it is unquestionably an important agent in the armamentarium of the progressive doctor.

Dr. H. H. Hazen, Washington, D. C.—It is really delightful to hear Dr. Samuel say that radium does not cure everything. He is taking such a different attitude from some of the radium enthusiasts.

The figures of Dr. Bloodgood clearly show that the education of the public in regard to cancer has been doing much good, for all surgeons are seeing fewer and fewer inoperable cases. At least they were until the radium craze came along. At the present time they are again beginning to see numerous hopeless cases,—cases that have been treated with radium. In other words, there is a very real and very grave danger that radium will do great harm to the legitimate cancer propaganda.

I feel strongly that every man who is using either radium or the X-rays should have a competent surgeon see every case with him: it would be better for every one concerned.

As to radium's being a specific for the small basal-celled cancer, how can any one invariably tell a basal from a prickle-celled growth except by histological examination, and if that is to be made why not make it from the whole specimen? As has been repeatedly pointed out, it is very unsafe not to make a positive diagnosis, for the basal-celled growth can be cured by local treatment, and the prickle-celled growth is a big surgical problem because of its tendency to invade neighboring lymph nodes. To illustrate the danger, five years ago a patient consulted me because of a cancer of the leg. I advised operation, which was refused. The Roentgen rays healed the growth and it remained healed, but three years later the patient returned with an inoperable mass in the groin. He is now dead.

I feel very strongly that radium should not be used externally to control carcinomatous glands, for I have seen them spread like wildfire under such applications.

In regard to the question of the X-ray versus radium, I have seen three cases treated by men who had plenty of the material at their disposal. In each of these instances operable skin cancers were made totally inoperable. In every instance the X-ray totally eliminated the growths, for the time being at least.

Dr. R. H. Foster, Meridian, Miss.—I had one case of a woman about sixty years old. treated by Dr. Samuel, which had gone so far that he considered her case hopeless and nothing could be done but make her comfortable. However, we had her consult Dr. Samuel after she had been curetted and the cautery used. I am glad to say she is at home and apparently well, but she was so far gone that one of my colleagues even criticised me for telling her she had cancer. He said: "Just let her go ahead and make her as comfortable as possible." But she is feeling well today, thanks to Dr. Samuel.

Dr. Samuel (closing).—Now, I left out on purpose the epitheliomas of the lip. If any X-ray or radium man says he will treat any of the lip cases, do not let him do so. It is a surgical procedure from the time the diagnosis is made. We can follow it up with radium and deep therapy afterward.

The ovary with regard to radium: The direct effect with the uterine application of radium is upon the endometrium. We can carry our radium so far that we will have an effect upon the ovary, but that is what we avoid doing, in the younger cases, especially. We can not avoid it in the X-ray, but we can with the radium. We have none of the terrible symptoms you see from a pan-hysterectomy,—an artificial menopause, etc. But it is more of a gradual change, and we can certainly control it in a fairly satisfactory manner.

I said in the beginning of my paper that just as soon as a small amount of radium makes its appearance in any town the papers get hold of it and laud it to the sky. That is one thing we have scrupulously avoided—about the amount of radium we have. It is known to the profession only. On several occasions the newspapers have tried to find out how much we were using, but we have absolutely avoided any publicity.

Dr. Hacon also spoke about the glands, regarding recurrences in the neck or wherever else they may be. I must say that when we have buried the radium directly into the mass we have seen the glands disappear, but they come back in the opposite side just as quickly as you make your application. What good you accomplish I do not know. We are making the patient comfortable and carrying them on a little longer. What more, I do not know.

He also spoke about radium and X-rays' not being superior to each other. I said one was good for one thing and one for the other. I agree with him when he says the surgeon should see them first. There is not a case accepted by me until the man who refers them is known by me personally and that we know what he is doing. That is one thing we are doing: we try to keep out of trouble.

I do not want you to think the Coolidge tube is not an efficient instrument. It is wonderfully efficient. I said before that every man who uses the tube should be licensed to use it; that the general practitioner should not be allowed to do it, if there is any way to keep him from it.

I was telling a gentleman downstairs this morning of a case referred to me from Texas not long ago, of a doctor who was in one of the Northern clinics and heard a great deal about the tube. He got a small portable outfit. The patient was referred to me in about two and a half months after he had started to treat her for a large uterine fibroid. Gentlemen, it was the most horrible mess I have ever seen in my life. All over the lower abdomen was a slough as big as a soup plate. This man had taken the tube, used it absolutely open, without any filtration whatever, and had given that patient one-hour sittings. That is the plea I want to make, gentlemen.

AUTHORS' ABSTRACTS

Surgery, Gynecology, Obstetrics and Genito-Urinary Diseases.

Regeneration in Peripheral Nerves: An Experimental Study. Edwin G. Kirk and Dean D. Lewis, Chicago, Ill. Bulletin of the Johns Hopkins Hospital, Vol. XXVIII, No. 312, February, 1917, p. 71.

A second series of experiments confirms the authors' former conclusions as to the superior value of tubulization with fascia (lata) in the repair of nerve-defects too large to permit of direct approximation of ends except with the employment of undue tension on the nerves,—a condition predisposing to failure. The use of *autotransplants* of fascia is urged, as they are viable, and all inflammatory-absorbtive reaction and consequent cicatrisation are thus avoided.

As each of this series, representing nerves in every stage of regeneration from one day to fourteen months, was examined microscopically in complete serial section, ample opportunity was afforded for study of post-traumatic regeneration. The first stage consists in a rapid proliferation of the delicate neurilemmal sheaths (of the nerve fibres) which become protoplasmic, while their nuclei (few in the resting stage) increase enormously in number. Thus the neurilemmal sheaths become converted into protoplasmic bands, which grow from both proximal and distal nerve stumps into the coagulated fibrin-serum, which has meanwhile filled the uniting fascial tubule, or, in case of direct approximation, cemented the ends. These neurilemmal bands from proximal and distal stumps unite and finally *constitute complete protoplasmic tracts, along which the regenerating nerve fibres proper (axis cylinders) from the proximal stump grow,* eventually reaching the empty neurilemmal canals of the distal stump. While the sheaths (bands) grow from both stumps, all efficient regeneration of nerve fibres proper (axis cylinders) is from the proximal stump only.

Raymond's Disease. E. S. DuPuy, Beckley, W. Va. The West Virginia Medical Journal, Vol. XII, No. 8, February, 1917, p. 279.

Case No. 1.—Young man, 18 years old, in fairly good health. Began with neuralgia of the arms and legs, which ended with swelling and asphyxia of some of the fingers and toes. The affected parts returned to their normal condition, but finally grew worse and the asphyxia resulted in gangrene. Some fingers and toes were amputated. His condition improved for a time, but after several months he had another attack and died.

Case No. 2.—This was a woman. The asphyxia was marked. Skin was cold and blue. She was only seen once, so the outcome can not be stated.

Case No. 3.—Male, aged 27. Complained of itching and pain in toe six years ago. Little finger on right hand began to itch; turned red, blue and black in order. Was amputated at distal and middle phalangeal joint. Two years later had some trouble in fourth toe on left foot. Had it amputated. Three months ago end of small toe on left foot began as did adjoining toe two years previously. Was in the hospital at the time and had local treatment, which temporarily relieved it. Later he was compelled to return to the hospital, same little toe giving him trouble—red-bluish in color and small ulceration on ball of toe. Painful to touch. Complains of itching and pain and not much swelling in toe. Mother died of same trouble. In her case it had extended above the knee.

The diagnosis is made by the following: the asphyxiating condition of the tissues precede gangrene; the fingers and toes are mostly affected; sometimes the ears and nose; and gangrene is symmetrical. The cause of Raynaud's disease is not known, and the pathology is still obscure. The treatment is unsatisfactory. Frost bite most resembles the disease, but it differs from all forms of gangrene.

Fascia and Fat Transplantation. Dean Lewis, Chicago, Ill., Surgery, Gynecology and Obstetrics, Vol. XXIV, No. 2, February, 1917, p. 127.

Fascia is an ideal material for transplantation. The amount is relatively inexhaustible. Enough fascia can be removed for any plastic work that has to be undertaken without interfering with the function of the part from which it is removed. Fascia may be used to form tendons. In repairing extensor tendons, strips of fascia should be used; in repairing defects in flexor tendons it is

better to construct fascial tubes. These remain patent and the tenoblasts proliferate down the tube to form a new tendon. In reconstructing tendons it is essential that functions be assumed early. It is generally necessary to prepare for fascial transplantation by transplanting a skin flap with considerable fat, through which the fascial strips are passed, after a canal has been tunneled through the fat.

Fascial tubes may be used in the repair of nerve defects. The failures following nerve suture have often been due to the fear of resecting the ends of the nerves sufficiently to expose healthy nerve fibers. Axis cylinders pass readily through a fascial tube. Protoplasmic bands precede the development of axis cylinders and provide conduits along which the axis cylinders pass.

For purposes of neurolysis and tenolysis fat is superior to fascia. In both of these operations considerable scar tissue is usually present and fascia will contract in the presence of a scar. Successful results have been obtained in both neurolysis and tenolysis after fascial transplantation, but fat can be used more generally and is the material of choice.

Fascia will live in the presence of excretions. It has been employed successfully clinically and experimentally to form a common bile duct. In some instances in which it has been used experimentally there has evidently been an interruption of peristalsis, because the bile ducts have become dilated above the point of insertion of the fascia. When used to repair the ureter, the fascia tends to undergo ossification and bone has been formed about the defect in which the fascia was placed.

When fascia is used to close dural defects, it is well to transplant a thin layer of fat with it, for fascia may contract dense adhesions with the pia arachnoid. Fat may also contract adhesions, but these are usually delicate and may not cause the functional disturbances often associated with the dense adhesions which follow fascial transplantation.

A Study of the Menopause with Special Reference to Its Vasomotor Disturbances. Carey Culbertson, Chicago, Ill. Surgery, Gynecology and Obstetrics, December, 1916, p. 667.

This article develops the theory that the menopause represents a disarrangement in the chain of glands possessing internal secretions, the disarrangement being a purely functional one due to the withdrawal of the ovarian active principle. The author demonstrates that in this way the instability of the climacteric may be explained and that the best evidence of this instability is found in studying the blood pressure in women showing ovarian deficiency. Twenty-nine cases are described in illustration of this feature, seventeen of which reports are accompanied by blood-pressure charts. These show that during the occurrence of hot flashes there is an instability in arterial tension, characterized in most cases by an increased systolic tension, the diastolic tension being not proportionately elevated. This produces a pulse pressure considerably above normal, thus occasioning cardiac palpitation. The hot flash is produced by the sudden elevation and subsequent depression in the blood pressure. The author succeeded in causing vasomotor disturbances by the injection of doses of adrenalin or pituitrin in such cases, blood-pressure readings being taken every five minutes during these tests. Where hot flashes were absent, arterial tension was always fairly stable, and pituitrin or adrenalin would then excite no response. As a result of these observations the theory is offered that, as a result of absence of the ovarian hormone in the menopause, the hypophysis and adrenal secretions are not neutralized as formerly and hence produce tension instability expressed in the various vasomotor phenomena.

By feeding his patients the missing element represented by corpus luteum extract, the author was able to stabilize the blood-pressure, thus reducing the hypertension and causing a disappearance of, or marked decrease in, the vasomotor symptoms. This reduction of blood-pressure by organotherapy together with the disproportionate systolic and diastolic rise is offered as evidence that the hypertension is a functional one and not due to organic changes

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The Fate of Phenolsulphonephthalein when Injected Into the Animal Organism: Factors Other than the Kidney Influencing its "Retention": Preliminary Report. Edward C. Kendall, Rochester, Minn. The Journal of the American Medical Association, Vol. LXVIII, No. 5, February 3, 1917, p. 343.

It has been established that phenolsulphonephthalein may be destroyed within the body by being reduced. In the presence of sufficient oxygen, it is not destroyed in the body. Therefore, whatever conditions result in a lack of oxygen in the tissues are factors other than the kidney influencing its "retention." These factors are damaged circulatory system, low hemoglobin, therefore diminished oxygen-carrying capacity for the blood, and conditions of the lung which prevent the proper aereation of the blood. Besides these factors resulting in the destruction of the dye, there is a possibility of mechanical retention over a prolonged time so that the substance does not appear within the limit of the test. This mechanical retention without destruction of the dye is possible in certain cases, chief among which is the condition of acidosis. In regard to the mechanism of its destruction, it is found that certain tissues readily destroy the dye when mixed in vitro. The liver has the maximum destroying capacity. Next in order are the muscles and intestines, while the spleen, pancreas, lung and kidneys have practically no destroying power. The mechanism of the destruction appears not to be a specific enzyme acting upon the phenolsulphonephthalein, but the action is produced by some powerful reducing substances generated within the cells. This action is carried on only within the cells, the blood having no destroying power. There is evidence that possibly nascent hydrogen is the destroying agent.

(Continued on page 510)

MILITARY, RAILWAY AND EMERGENCY SURGERY

GUNSHOT WOUNDS OF THE CHEST OBSERVED IN THE LATE TURKO-BALKAN WAR AND IN THE PRESENT EUROPEAN WAR*

By Edgar L. Gilcreest, B.A., M.D.,
Dallas, Tex.

It is a fact that the resistance of the tissues, together with the sectional area and the high velocity of the projectile, are the determining factors in the destructive extent of such wounds. The humane features observed in a large percentage of gunshot wounds of the chest received at the base hospitals are due to the fact that the sectional area of the reduced calibre bullet is so small and that the lung tissues offer no resistance. But this does not take into account the very large number of destructive chest wounds from ricochetting bullets and shell fragments which cause death immediately or a few hours after injury.

As the distance between the opposing armies in the present war is much shorter than was the case in the Turko-Balkan War, firing is carried on in zones in which bullets have an excessive power; and I am sure statistics will show that the destructive effects of chest wounds are much greater in the present war than in the former.

In the Turko-Balkan War it was not possible to have an interpreter always at hand, and often our histories were indeed necessarily meager. In the present war, however, most of the soldiers were English. Out of 15,000 cases admitted to the hospital within nine months, 697 were wounded. Out of this 697 total wounded, 28 had gunshot wounds of the chest. It was my good fortune to have Sir William Osler examine many of these cases with me on his visits to the hospital.

Gunshot wounds of the chest may be divided into two groups: (1) non-penetrating and (2) penetrating. The former group includes contusions and lacerating skin wounds without involvement of the pleural cavity.

The symptoms of penetrating gunshot wounds of the chest are so extremely variable that it is frequent for a soldier not to realize that he is shot for some moments after injury. Again, he may immediately be overcome with profound shock. A number of soldiers told me that they had no idea that they had been shot until some blood came up into their mouths or until they began to cough and expectorated some blood. The pain that is usually caused by a bullet's penetrating the chest is often described as being not unlike the quick stroke of a whip. A number of soldiers ran for some distance after they had been shot and then faintness overcame them. Some vomited immediately and then fainted.

The clinical picture may be very alarming at first, as characterized by a pale and anxious face, cyanotic lips, labored respiration interrupted by frequent coughing, rapid and small pulse and a cold perspiration.

Complications. — Penetrating wounds of the thorax may be followed by hemoptysis, hemothorax, pneumothorax, emphysema, and some days later by pneumonia, bronchitis, pleurisy, abscess, gangrene or hernia of the lung.

Hemoptysis is common, occurring usually in about 60 to 75 %. In our series, it occurred in only about 55 %. The amount of blood coughed up was variable, depending upon the size of the injured vessel. In some, hemoptysis was immediate, while in others it did not begin until the next day, and even in some as late as the third day. The duration was variable, though usually from three to five days—in one case a month.

Hemothorax is a common complication and can be a most serious one when it is copious and persistent. It occurred in seven of our series. There is, doubtless, at least a slight hemorrhage in every

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penetrating wound of the chest, often with no discomfort and a speedy convalescence. With fracture of the rib, hemothorax is present in nearly every instance. In fact, La Garde states that large effusions of blood generally arise from wounds of the chest wall rather than of the lung tissue. There were rib fractures in four of our series. Fever developed in about 25 % of the cases, probably due to absorption of blood. It ran from 99.5 to 102° from several days to three weeks. Dyspnea is one of the early distressing signs and persists as long as there is a large effusion. Fracture of the rib naturally aggravates this condition. When the effusion is not extensive, it disappears in about three days. In only two of the cases was thoracentesis indicated. In one, we aspirated 1,000 c. c. and in another 500 c. c. at one time and 900 c. c. at another. It was interesting to note the uniform character of the physical signs. On the affected side, the expansion was slightly decreased, tactile fremitus usually present, the percussion note higher pitched, grading into flatness at the base, breath sounds faint and tubular. The chance of infection has to be considered in every case of hemothorax. The wounded men should, therefore, be transported as soon as possible after the danger of hemorrhage has passed to a station where the infection can be properly and adequately dealt with. But it is highly important that this transportation should be as short as possible.

Gunshot wound of the chest. Wound of entrance in side and exit in front.

Gunshot wound of the chest. Entrance in front, exit behind.

Pleurisy.—In addition to hemothorax, a serous pleuritis often develops. A few days after the injury, the dullness is no longer caused by the hemothorax alone, but by the serous exudate. This secondary pleurisy is the most frequent cause of cases of long-continued fever, which, however, subsides as the exudate is absorbed.

Septic Hemothorax.—On account of the frequent primary infection in this war,

every case of hemothorax with fever must be suspected of sepsis. Primary infection occurs in about 25 % of the effusions and is fatal in about one-third of the cases. Infection should be suspected in all cases not progressing favorably after the fourth day. It can not be diagnosed with certainty on the clinical features alone, but a sample of the fluid should be withdrawn and examined bacteriologically. Bradford and Elliot have enumerated the following points as indicating this condition:

Gunshot wound of the chest showing wound of entrance in front and wound of exit behind.

1. Progressive fever or sustained high fever or oscillating fever, showing no uniformity in the temperature curve.
2. Rapid pulse of 100 to 120 or higher. It should be remembered, however, that even with a severe infection, the pulse rate may be only 80 or 90.
3. Dyspnea out of proportion to the physical signs and increasing instead of decreasing.
4. A furred tongue.
5. Sleeplessness.
6. The appearance of tenderness..

The severest infection which we had was in a shrapnel wound case. The wound of entrance was one inch above the left nipple, with its course downward, making its exit posteriorly in the middle of the left dorsal region at the level of the tenth rib, which was fractured. The patient was admitted three days after injury with signs of an acute pleurisy. He ran a fever of 103°, had hemoptysis for ten days, and showed signs of fluid

Gunshot wound of chest. Entrance to left. Exit to right.

in the left chest. The left tenth rib was resected and about 300 c. c. of serosanguinous, purulent fluid evacuated and a rubber tube inserted. He soon gave evidence of an esophageal fistula, as particles of food were coughed out through the wound of exit. He ran a septic temperature and looked to be in a desperate condition, but gradually cleared up. This is the note that Dr. Osler dictated on his discharge, six months later: "The injection of bismuth shows no evidence of esophageal obstruction. The expansion of the left chest conspicuously less than the

right, and measures four and one-half inches less. The bony prominence of scapula is well marked over whole left back. There is a widespread area of cardiac impulse in the nipple line. Vocal fremitus is well marked over whole back. On percussion in front, there is flatness from second left rib down and considerable flatness at left base posteriorly. On auscultation, breath sounds much suppressed over left lung and over left base; behind, only a faint respiratory murmur is audible. The wounds have healed, patient has gained fifteen pounds and feels well."

Retained Foreign Bodies.—We had only one case of retained foreign body. The wound of entrance was over the third left rib, two and one-half inches above and to the left of the nipple. As soon as he was shot he vomited and then fainted. He had hemoptysis for two days and ran an afebrile course. This is the note made by Dr. Osler on fluoroscopic examination: "The retained foreign body is nearer the anterior than the posterior chest wall. It moves with the lung on respiration: on expiration going behind the heart shadow, and on inspiration moving about one and one-half inches upward and toward the left axilla."

Prognosis.—The prognosis of gunshot wounds of the lungs is comparatively good so far as immediate recovery is concerned, but there is no doubt that they leave the lung with a decreased functional capacity that tends to favor the development of tuberculosis later. A latent process, which perhaps the patient never knew of, may be awakened into activity by trauma. In order to prevent it, patients after gunshot wounds of the lungs should be given a period of heliotheraphy.

Hemorrhage and sepsis are much more serious matters in the prognosis of chest wounds in this war than in any wars preceding it.

Injuries of the left lung are more serious than those of the right; perhaps because of pressure on the heart, or on account of pressure or traction on the large vessels.

Mortality.—It is interesting to compare the mortality in gunshot wounds of the chest in former and in more recent wars:

Crimean War (French)	91.5 %
Crimean War (English)	70.0 %
Civil War (United States)	65.5 %

With the introduction of the modern rifle, firing a steel-jacketed bullet, this high mortality began to lessen, as is shown in later wars, namely:

Spanish-American War	27.5 %
Anglo-Boer War	14.0 %
Russo-Japanese War	3.6 %

In the present European War, a large mortality is expected, since the shell and sharpnel wounds are more frequent and the unstable Spitze bullet is in use. The causes of death in the infectious cases are empyema and pneumonia; and in the non-infectious cases, hemoptysis and pneumothorax. Up 'till the third day, hemorrhage is the principal cause of death, and after this time, sepsis.

Treatment.—(1) The first essential is rest, as quickly and as completely as possible. The patient should be put to bed in a position to favor expectoration. (2) Morphine should be administered at once and afterward with a free hand. The importance of this was impressed upon me five years ago in a gunshot wound of the chest with course downward, penetrating the diaphragm and probably the transverse colon, which was under my charge in Crile's clinic in Cleveland. The patient was admitted in apparently a moribund condition, with respirations 40. On Dr. Crile's suggestion to break up all association in this man and to put him completely at rest, I had this patient given a one-sixth to one-eighth grain of morphine hypodermically every hour for 48 consecutive hours, missing only three times in this period. Under morphine, the respirations were held at from 12 to 14, peristalsis ceased, and the patient made a complete recovery. (3) The affected side should be immobilized, preferably with adhesive straps.

Great care should be exercised in the transportation of these cases.

The general treatment of hemothorax should be expectant; puncture should be done only when the volume of the effusion threatens serious complications or when it shows signs of becoming purulent. For the first week, it is dangerous to puncture for fear of causing renewed hemorrhage; but after this time puncture may be done, and if there is marked dyspnea it should be done without fear, for the fluid at

this time is generally found to be more serous than sanguinous. Great caution should be observed in the amount removed. Some hesitate to remove more than 100 c. c. at first unless there are grave pressure symptoms. Afterward, as much as a liter or a liter and a half can be removed safely.

In the further course of these stubborn exudates, it is important that they should be punctured frequently, for if the lung is prevented from expanding for a long time, there is danger of chronic pneumonia.

A closed pneumothorax should be left alone or the air removed by suction; an open pneumothorax should be closed if possible. In the early stages of an infected pneumothorax, frequent puncture is preferable to operation because of the danger of hemorrhage and collapse following operation.

Septic Hemothorax.—Here, delay in diagnosis may prove disastrous. The patient's strength is reduced, more or less permanent injury to the chest from thickened, inflamed pleura is produced, and fatal septicemia may intervene. While infected fluid may be removed by aspiration, the entire removal of clot and pus is only effectually gained by resecting a rib or two and introducing thorough drainage. Therefore, a fully developed case of pyothorax always indicates a thoracotomy. Sauerbruch, however, claims that puncture is to be preferred to rib resection, even in most cases of hemothorax developing an empyema, operation being indicated only in a putrid empyema—the beginning of a gangrenous process.

In draining such cases, Schmerz in Von Hacker's clinic in Austria, where I worked a year, has developed a special apparatus which consists of a conical perforated rubber stopper 4 cm. wide at one end and 3 cm. at the other, and 4 cm. in length. Through the opening in the center passes a glass drainage tube, to one end of which is attached a rubber tube leading to a vacuum bottle. A plug of tissue, somewhat smaller than the stopper to be inserted, is cut out down to the rib. The rib is now resected and the pleura opened by a Pacquelin cautery and the stopper immediately inserted before the pus has time to overflow the incised area. By means of specially prepared straps, the stopper and tube are held firmly in place. This method has the following advantages: (1) All pus passes through the tube, therefore (2) the surrounding tissue is not infected; (3) as the small vacuum bottle is easily fastened to the chest, the patient is not confined to bed, but sits and walks around in the fresh air and sunshine all day; (4) the duration of drainage is much shortened. Of ten cases which had been handled by this method while I was there, in eight the discharge ceased on the eighth or ninth day—certainly a very rapid healing. In two very serious cases, the discharge lasted in one 18 days, and in the other four weeks.

In shell and shrapnel injuries, conservatism often proves inadequate and operative measures must be substituted.

For the convalescent patients, respiratory gymnastics should not be overlooked.

Heart.—Gunshot wounds of the heart usually end fatally within a few moments after injury. However, there are not infrequently cases reported of gunshot wounds of the heart and pericardium with recovery, and one marvels at the escape. These injuries or apparent injuries from shots traversing the cardiac area have been the source of comment by nearly all observers in recent wars. We had only one case — a man wounded at Neuve Chapelle. The bullet entered the sternum half an inch from the junction of the third right costal cartilage and made its exit through the lower end of the scapula. Judging from its course, it must have traversed the right auricle. The man had hemoptysis and an irritating cough for some days which gradually disappeared.

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THE DIAGNOSIS OF TRAUMATIC NEUROSIS*

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A specialist does not need to apologize for presenting a psychological subject to you surgeons. This neurosis has been the bugbear of medical men for over half a century now, and it promises to continue to be the bugbear of medical men for a long time to come, until, eventually, the courts and the juries can be educated to the medical man's point of view of the psychological origin of the conditions.

You remember how the work of Erichsen first laid the foundation for the organic theory for the traumatic neurosis, and with it his idea of spinal concussion which has contaminated our literature and courts, and which has made this subject the big legal element it is today. And then, later, the work of Charcot, who considered these terrible functional disturbances of the nervous system. Later came this psychological school wherein neuroses were looked upon as purely mental. This is the modern view.

In the traumatic neurosis we are dealing not with an organic condition, but rather with a state of mind. As for the condition itself, we no longer attempt to differentiate between a traumatic hysteria and a traumatic neurasthenia. In reality the trauma has but little to do with the causation of the condition. Whether or not an individual receiving an injury, often a very slight one, develops a traumatic neurosis or nothing at all, depends not in the least upon the nature or severity of the injury, but rather upon the personality of the one injured. Thus we make no attempt to differentiate between these two conditions and lump them all together under the "traumatic neurosis."

It is necessary for one to understand the nature of the neuroses before one can hope to go on to diagnosis.

In the first place, in the business of being sick there are three separate and distinct things any one or more of which may exist independently of the others. The first is being sick; the second feeling sick, and the third acting sick. These things do not always exist together, and there our difficulty of diagnosis comes in. For instance, a man with a lobar pneumonia is sick—he feels sick, and he acts sick. The neurotic is not organically ill, but he feels sick, and often much more so than one with an organic lesion. The malingerer, on the other hand, is one who is not sick, who does not feel sick, but who acts sick. We can see the other side of the picture in many of our walking typhoid cases, and in other severe diseases in which the individual refuses to go to bed. Here we have a man who is sick, and feels more or less sick, but he does not act sick. Now, the mistake is made in assuming that one can state that any man is sick simply because he feels sick and he acts sick.

That is the reason for our psycho-therapeutical cures, for those of Christian Science and other religious cults. They handle individuals who are not sick, but who feel sick and when, through a psychological process they cease to feel sick, they are cured.

The diagnosis, then, of this condition depends upon the understanding of the symptoms and the physical signs that the patient presents. The symptoms we include under the heading of feeling sick, and physical signs come under the heading of acting sick; and what I mean by being sick is pathology.

In the central nervous system the feeling and acting sick of organic conditions are absolutely consistent with what we know of the anatomy, physiology and pathology of nerve tissue. The symptoms and clinical signs of neuroses are not consistent with our knowledge of physiology and the anatomy of the nervous system unless the patient has a knowledge of these subjects. Every man builds his

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neurosis according to his knowledge and according to his needs. The neurosis is always an explanation. It is the explanation the individual gives to himself and to the world why he unconsciously feels sick; and if one can alter the explanation to a more rational one he recovers. Thus we see the reason for the inconsistencies in symptoms and signs which stamp these things as neurotic, psychological and not as organic.

I shall mention a few of the common symptoms of neuroses one meets in a large clinic. These are the things the patient feels. He comes to us feeling a certain thing and acting out a certain part which would make those feelings appear rational. They may be quoted under three heads: (1) Pains and paraesthesias; (2) anesthesia; and (3) weakness.

THE PAINS AND THE PARAESTHESIAS

The pains of the neurotic are matters of perception and not of nervous impulse. The pains and paraesthesias of the traumatic neuroses are usually located in organs or members important for the welfare and happiness of the individual. These pains are not constant as are pains of organic origin. The pain in the arm, in the traumatic neuroses, for instance, is not the steady pain that one sees in a fracture or in true neuritis or in the spinal cord tumors. They very seldom interfere with the patient's sleep, and this is a rather important diagnostic point. When the patient's mind is distracted from his painful limb, head or spine, or whatever it may be, he no longer feels the pain. He does not show any signs of pain until his attention is again attracted to it. Neurotic manifestations do not as a rule exist outside the field of attention. Again, the neurotic pains may or may not be accompanied by tenderness.

We know that in local lesion pains are always accompanied by tenderness. It is a necessary accompaniment to pain, for tenderness simply means an increase of pressure pain. In neuroses tenderness is only seen, if there is tenderness, in the field of attention. One finds, for instance, a man with an arm that is extremely painful, and when you touch it he will scream with pain. If his attention be distracted, you may apply considerable pressure to that painful limb and elicit from the patient no further evidence of the pain, showing that it is rather a matter of psychological interpretation than true pain sensation. The pain in these neurotic arms usually is increased by passive motion. But often again this is inconsistent. One often finds in painful arms that by rotating the arm in a way from which one would expect to find the pain in the shoulder, that is external rotation at the shoulder with the elbow semi-flexed, the neurotic complains of the pain oftenest around the elbow, especially if you grasp the elbow rather firmly in the process. In other words, he does not get the pain where he should get it. The same is seen in internal and external rotation of the hip. Here the pain is felt not in the hip, but most often in the knee.

THE NEUROTIC ANESTHESIA

Here we have a matter of real sensations which do not get into the consciousness. The sensations go up, all right, but they do not get past the threshold of attention and so never become conscious. Very frequently we find that the touch sensation may be perfect, while that for pain may be lost. Nevertheless, temperature sensations are seldom disturbed, and pain anesthesias of organic origin do not exist without temperature anesthesias. The anesthesia usually occurs in the paralyzed parts. Besides this, we may point out several other things which make the diagnosis as due to a condition of purely psychological origin. In the first place, you never see the burns or skin injuries which are such common accompaniments of syringomyelia. Those individuals do not harm themselves with fire and harmful things. Again, we do not see the glossy skin of neuritis. The skin looks healthy and normal. It is healthy and normal. The difficulty is purely in the organ of consciousness.

Again, one often sees in the traumatic hysterias following accidents a complete hemiplegia with a hemianesthesia. This anesthesia goes exactly to the median line and stops. If you try out the abdominal and epigastric you will find they are perfectly normal. The reflex is impossible if the reflex arc is broken, and if there is an organic anesthesia of the skin the superficial reflex can take place. In

these cases of hemianesthesia the superficial on the paralyzed side are as good as those on the other.

PARALYSES

If an individual does not move his arm or leg it may be assumed that there is any one of three reasons for it. Either he can not move it, else he will not move it; or, the third possibility is that he can not will to move it. If he can not move it, it is paralyzed. If he will not move it, he is a malingerer. If he can not will to move it, he has a neurosis, or possibly dementia precox. We see neurotic paralyses, generally, in the right arm and hand, for that is the most important member for the earning capacity of the individual. We find these paralyses seldom of a flaccid type. When you realize that these conditions are psychological, you will see why this is so, for it is much easier to increase the tone of a muscle by a voluntary act than to decrease it.

The paralyses of the neuroses are nearly always accompanied by pain and passive motion, and here again the pain is very often in the wrong place. Again the paralysis, as the pain and the anesthesia, exists only in the field of attention. For instance, you may ask the patient to grasp your hand to see how much strength he has, and you find almost none whatever in the fingers with which he grasps your hand, but if you tell him to pull your hand, grasping his flexed fingers with yours, you will find very good power, showing that it is not paralysis at all. Again, if one pulls the hand out in this fashion, the patient very often complains of pain. One would expect to find the pain on the anterior surface of the arm. The pain of the neurotic is usually on the back of the hand—a position where it could not be if the trouble were due to organic lesion. Again, these patients should be watched carefully, for although he may have a stiff hand which he apparently can not move, nevertheless you will find him making automatic movements, such as scratching the head or brushing off flies. Those are unconscious—outside the field of attention. Or else, if the patient is dull enough, you can fool him into doing the wrong thing. Say, "Show me how far up your hand could go before it was paralyzed," and it will go up in the air.

Again it is necessary, in examining these cases, to see how they act in dressing and undressing. I, not long ago, had a case in which a man, though completely paralyzed in the right hand, was able to button his collar perfectly and tie his tie; and any one who has even a sore thumb knows the difficulty he has when he comes to button up his collar. Then of course the arm and the knee and ankle jerks must be, of necessity, increased where the spastic paralysis is of organic origin. They are not increased in the traumatic neurosis.

In the traumatic neurosis one is dealing with a purely psychological condition, not with a disease but with a state of mind, and not with a conscious malingerer. You are not handling organic disease. You are handling a purely psychical state and one that, as you all know, is cured when it no longer has reason for existing. A neurosis is an asset. As long as an individual gets anything by being a neurotic, he is going to be a neurotic. That is the reason you get the recovery of the patient after a favorable verdict by the jury.

DISCUSSION

Dr. Tom A. Williams, Washington, D. C.—It is very gratifying to have here shown so clearly the true nature of the reaction of persons complaining of neuroticism after an accident. In this question the important problem is to differentiate between the person who is deliberately trying to deceive some one for material gain and the patient not trying to deceive, but who wishes to be sick because of the belief that he ought to be.

Now, these two situations, although morally different, are not distinguishable by neurological methods. The reactions are similar; the motives differ. Only by contingent evidence is detection possible. I can not here enter at length into the considerations to be borne in mind in such cases. Those interested must consult my article on "Traumatic Neurosis," Am. Jour. Med. Scs., 1914, or on "Occupational Neurosis" before the International Congress of Medicine, London, 1913, Trans. Neurological Section. All one can do is to find out whether or not we are dealing with some physical or some psychical situation which exists in the patient's mind as to what he considers a grievance. If he can be shown that he has no grievance because he is sick only because of his point of view, he can be cured, and of course will then forego the litigation for damages. That can be done, as I can personally vouch by examples.

But we must not forget that even a person who has some physical damage can be made not to feel pain if he is distracted; and I have seen

gross mistakes made in saying that patients were neurotics because they ceased to feel pain when they were distracted. If the distraction is serous enough, the pain of a very severe blow will not be felt, as any one knows who has played football, when a severe blow on the shin is not felt at all because of the distraction by the excitement of the game. So we must not draw too hurried a conclusion about a patient in whom our examination creates a modification of the sensibility.

My experience as a neurologist is not the same as that of Dr. Casamajor when he tells us that he finds most functional paralyses are spastic. Along with Babinski and other authorities, I find the majority of psychogenetic paralyses to be flaccid. But diagnostically it does not matter whether a paralysis is flaccid or spastic in order to determine whether it arises or not from some impairment of the neuronal arc. The reflexes are an infallible guide if observed by one who knows and correctly interprets. Any neurologist should make a diagnosis infallibly; and every surgeon might learn a few of the simple signs. For instance, a simple sign for organic paralysis of the arm is to put the forearm up like this (illustrating). If the neurones are intact, it stays that way; but if there is a spastic paralysis, it will fall because of failure of innervation through the pyramidal tract. In a psychogenetic paralysis the wrist does not fall unless the patient has no inkling that it should fall.

The best way to handle cases of neurotic accident, however, is through a medical referee. For the patient is rarely going to think the railroad surgeon is not prejudiced in favor of the company. His own doctor is often in sympathy with the patient, and is apt to reinforce his grievance. I have had a number of cases referred to me in this way, and I can generally satisfy the patient that my interpretation is right. If I can convince the corporation, too, the case does not go to trial. Sometimes I can not satisfy the patient. In the Hill case I could not satisfy the patient; but what he thought was spinal disease was disproven at the trial by his walking and doing exactly opposite to what he should have done, which the jury was shown by my testimony in court. (See report in New Orleans Medical Journal, St. Paul Medical Journal, also in Journal of Criminal Law, January, 1917.)

However, if there is introduced any other testimony, however authoritative, of some one not versed in neurology, the case will be lost because confusion will be raised in the minds of the jury. I have been in two such cases, one in Washington, one in Richmond, where another man, ignorant of modern neurology, was brought in, and we lost the case because the man brought in used big words which confused the jury.

In cases where a rational, simple explanation has been given to the patient, even where the cause is purely psychological, the corporation should compensate for the loss of time. Even though the recompense is small, the matter is thus usually adjusted satisfactorily. There is pending a case in Washington which the lawyers on both sides have asked me to settle.*

Railroad companies have told me they would rather I was not connected with them because I could be of more use to justice as an independent neurologist.

I believe that every neurologist can assist both the patient and the railroad surgeon by impressing upon the former, when there is no physical cause, how he can get away from feeling as he does. But that can only be done by a person thoroughly conversant with the diagnostic technic of neurology, with modern psychopathology and with sound psychotherapeutic procedure.

Dr. Battle Malone, Memphis, Tenn.—For a number of years past we have had expert testimony going before a jury, and even when it was possible to demonstrate very positively that there has not been any organic lesion, the minds of the jury are so confused by the terms used that they go ahead and give a verdict just the same as if there were an organic lesion. I remember a case where the man clearly had a neurosis, or was malingering, I don't know which, but he was paid $25,000. He was up and walking around in a few days after he got the money.

The point Dr. Williams brings out is the practical solution of the thing: That the jury shall have the thing so presented to them that they can be made to understand that the trauma had but little to do with the patient's condition. If the patient's condition is one of auto-suggestion, and one self-inflicted, I think if Dr. Williams' suggestion is followed out therein lies the only hope of the railroad companies in fighting these so-called traumatic neuroses.

Dr. George H. Moody, San Antonio, Tex.—I was very much pleased indeed at the author's suggestion that these conditions are psychoses instead of neuroses. So much am I of that opinion that the name of the paper seems to be more or less a misnomer. I am sure that is borne out by the contents of the paper as presented.

I think the term traumatic neurosis and allied terms are very great misfortunes. I think we would all be better off if such expressions had never been used. It is unfortunate not only for the corporation but for the patients who suffer from these conditions. It is easy for the patient to learn that he may have one of these conditions, and it is pretty hard for him to get it out of his mind when it becomes a confirmed belief. We talk about them as conditions arising from slight causes, but still we have to recognize, and the corporations are learning through the surgeons to recognize, that we have these conditions to deal with, and we can not dismiss them by saying that they amount to nothing; and it seems to me that the railroad surgeons who handle these cases have to treat them not lightly, but as seriously as other conditions, because they are diseases.

One important thing, though: A jury should be taught to estimate in these cases how much of the condition is dependent upon the trauma

*This case has since been settled on the basis of my report, but unfortunately from the point of view of the corporation, the patient proved to be more sick than her doctor had supposed, and in consequence the indemnity was increased because of my report on demand of the plaintiff's attorneys.

and how much upon the neuropathic inferiority of the individual. It would seem unjust for those who are supposed to be responsible for the condition after it exists to have to be responsible for the neuropathic inferiority.

Now the author of the paper wisely said whether a psychosis develops depends upon the patient. It also depends upon the personality of those who are going to be associated with an individual shortly after the injury is supposed to have occurred.

It is a very good idea for the corporation surgeon who is trying to help not only the company but the patient as well to let the patient know that it is for his interest from the standpoint of his future health that he should get early relief and settlement for claims that seem to exist and get through with it, in order that he may have a better chance to get well.

Dr. Joseph M. Burke, Petersburg, Va.—My experience along the line of general neurosis does not compare with the so-called "traumatic neurasthenia" which we find so frequently as a cause of action against railroads; in fact, cases of psychic and traumatic neurosis in my opinion and experience are found only in the court house.

When I find such conditions as pain in the back, can't sleep at night and the other allied symptoms of a pure nervous condition complained of, if it is with an employe and he employs a doctor other than the railroad physician, who is without cost to him, my diagnosis is that I have a fake case on hand which will give the company trouble.

Personally, I have never seen a case of pure traumatic neurosis or psychic neurasthenia, 'though I have read of such a case in Dr. Leigh's home city, which, in addition to the traumatism, produced the psychic condition, which predominated. As is frequently the case, if not always so, these neurosis cases get well immediately with the application of a greenback plaster, 'though the particular case referred to did not get well immediately after settlement, as the psychic element continued for some time thereafter.

I have found that the hotbed of mythical psychical neurasthenias, in so far as the Seaboard is concerned, is at Savannah. Dr. Owen is thoroughly familiar with conditions there. At one time I had his eminent advice and counsel in a so-called phychical neurasthenia case. A doctor for the plaintiff in this particular case, and who is nearly always employed and he so admits his employment against corporations, is, to say the least, ingenious in his testimony. He says that the presence of any sudden danger or mental shock associated or not with any physical injury and this shock even occurring with a railroad employe (whom you and I believe and know to be less prone to psychic shock) will produce the so-called traumatic neurasthenia or psychic shock. Dr. Owen was present in court and heard this doctor for the plaintiff say under oath that his interest in the outcome of the case was that if the plaintiff gets a verdict he (the doctor) gets a fee conditioned upon the size of the verdict, or a very fair fee if there is a good verdict in the case.

This so-called case of "psychic neurasthenia" was carefully examined by Dr. Owen, three other physicians and myself, and all agreed that the plaintiff had no symptoms whatever of traumatic psychic neurasthenia.

I have enjoyed the paper of Dr. Casamajor in which he has covered the subject of the diagnosis of traumatic neurasthenia, but it is not the true case that railroads are particularly interested in; it is those mythical cases that we would like to know about so that we may be able to make conclusive diagnosis, sufficiently at least to the satisfaction of juries.

Dr. Casamajor (closing.)—The point brought out of the personality of the individual is, of course, the most important thing. Traumatic neurosis does not differ from the occupational neurosis, or the neurosis of a man wanting to get away from his wife, or vice versa; it is the personality. Dr. Moody's remarks are very much to the point, and Dr. Burke's point of view on the thing is in the main in accord with mine.

Dr. Bailey, in an article about three years ago, described his own experiences when he was in a wreck. The train in which he was, hauling over a hundred, was known as "The Bankers' Special," carrying bankers, lawyers and other professional men from the country districts to New York. All of them were too busy to be able to afford a neurosis, and of that large number of men in that wreck (no one killed, but some rather badly hurt) not a single case of traumatic neurosis arose. The element of shock and injury was there. Had these people been day laborers who could have wasted the time, some might have developed a neurosis. Not one of them could afford to have a neurosis, and hence not one of them did.

FRACTURES OF THE LOWER EXTREMITY: THEIR TREATMENT*

By John C. A. Gerster, M.D.,
New York, N. Y.

The treatment of fractures of the lower extremity constitutes a most extensive field. The subject matter of this paper comprises a few technical procedures which the author has found of practical benefit.

Surgeons agree that the immediate reduction and mobilization of fractures—that is, within the first two or three hours—is the ideal method of treatment; and furthermore, that such reduction should be made under general anesthesia. Regarding immediate reduction one man has said, that a nurse girl in the park can

*Read before Southern States Association of Railway Surgeons, Auxiliary to Southern Medical Association, Atlanta, Ga., Nov. 13, 1916.

do more toward reducing a fracture just after it has happened than the very best surgeon later on, after swelling has set in. A Hawley table or Lemmon apparatus is of great assistance in obtaining proper reduction. If these are lacking, it is not difficult to obtain the desired traction by improvising with differential pulleys, S-hooks, webbing, a kichen table, etc.

For making traction on the lower extremity, the ankle sling devised by Dr. Howard D. Collins, of New York, has proven of great value. Full details of the technique are given in Dr. Collins' article in the *Annals of Surgery*, July, 1916, p. 65. Briefly, the ankle is thoroughly padded; the sling is then applied so that it forms two symmetrical Ys,—one on each side of the foot. Traction is made by pulling on the stems of the Ys. Care must be taken to have the slings form Ys, not Ts; in the former case (Ys), as soon as traction ceases, constriction automatically ceases; in the latter (Ts) the slings do not loosen and constriction persists. To assure this automatic relaxation, the angles of each Y must be on a level with the sole of the foot; secondly the Ys themselves should be covered with several turns of bandage material to prevent their becoming incorporated with the overlying plaster and thus hindering relaxation when traction is discontinued.

In the absence of the Hawley, Lemmon or similar apparatus for producing traction, it is customary to rely upon human assistance. Experience has shown that the assistant whose duty it is to pull, very soon tires and so fails to furnish the desired amount of traction. Recognizing this point, Hawley has had the traction strips lengthened sufficiently to meet and tie behind the assistant's back. Now, instead of pulling with hands and arms, the assistant simply leans against this loop—away from the patient—and thus maintains traction with a minimum of effort.

Plaster is applied in the usual manner, covering everything except the projecting stems of the Ys. Traction is of course sustained until the plaster has set, when the projecting stems of the Ys are cut off flush with the surface of the cast. The automatic cessation of constriction is proven by the change of color in the toes from deep blue to the normal pink.

Hackenbruch's turnbuckles constitute another mechanical contrivance of some value. Suppose a fracture has been put up in plaster and the X-ray reveals a moderate amount of over-riding. Before removing the cast and applying another, the following method may be tried: Make a circular division of the cast at the same level as the site of fracture; distract the two halves of the cast (upper and lower) by means of Hackenbruch turnbuckles, whose foot plates are incorporated in the cases—one on either side—until the desired correction has taken place. This method has decided limitations. I do not believe that shortenings of more than one inch can be overcome because of the danger from pressure necrosis over the tendo Achilles and dorsum of the foot. Mention is made of this method in connection with nail extension (to maintain traction in the presence of delayed union) in the description of cases below.

In the majority of instances, if Buck's extension is applied within a few hours after fracture, shortening is prevented. Here, another practical point may be mentioned, viz: the use of overhead suspension instead of allowing the limb to lie in a cradle on a hardwood track. After the usual adhesive plaster strips, bandage, wooden spreader and traction rope are applied, make strong enough traction to keep the broken limb straight. Now, maintaining this traction, raise the heel so that it clears the mattress 5 or 6 inches and have an assistant place the pulley at such a point that this position of the heel is maintained. The knee will be 3 inches from the mattress. The nurse is instructed that constant traction must be maintained and that if the knee sags, the traction is insufficient and it is her duty to investigate and to correct matters so that the proper amount of traction is once more obtained. As a matter of course, there is counter-extension with a perineal strap, the patient is given a box against which to push with his sound limb, and lastly, the foot of the bed is elevated.

In simple fractures a week or ten days old having from 1½ to 2½ inches shortening, such shortening can not be satisfactorily overcome by Buck's extension or Hodgen's suspension. The question remains whether to reduce such a fracture by an open operation or by some simpler, less formidable method. According to

the author's experience, as long as false motion is present (as long as the fragments can be angulated), even as late as four weeks after fracture, nail extension will effectively overcome shortening.

The employment of nail extension or its modifications such as the Ransohoff-Syms ice tongs, or the Finochietto stirrup, narrows still more the small group of cases in which open operation is indicated (interposition of soft parts, persistent malposition of fragments near joints, etc.). For details of nail extension technique the reader is referred to previous articles by the author (*Amer. Jour. of Med. Sciences*, August, 1913, p. 157; *Journal of the A. M. A.*, October, 1916, p. 1142) and to Steinmann's original monograph in the *Neue Deutsche Chirurgie*, 1912.

OPEN OPERATION

Lexer's X-ray studies of changes in the local blood supply during the healing of fractures have a direct bearing upon the technique of open operations. In a series of recently fractured limbs, the animals were killed at different periods and the main artery of the limb was injected with an emulsion of mercury and turpentine. Subsequent X-ray pictures showed great congestion of the blood vessels in the soft parts around the fracture. This local engorgement reached its maximum at the end of three weeks and then subsided in another week or so, as consolidation became established. The vessels in the bone close to the fracture-line showed no such degree of congestion as that seen in the adjacent soft parts. In the experiments where the periosteum was removed, the blood supply to the bony tissue was greatly reduced. According to Lexer, the main blood supply reaches the bone through the periosteum and therefore *greatest care should be taken to leave undisturbed the relationship between soft parts and periosteum.* For this reason he makes a long, ample incision down *to and through* the periosteum, using a large knife so that all soft part layers are practically undisturbed. The periosteum (in undisturbed contact with the soft parts), is then stripped from the bone for several inches above and below the site of fracture—according to Lexer as long as the periosteum-soft part relationship is intact nutrition is assured; in other words, one need have no fear of non-union after extensive subperiosteal denudation of bone. As additional proof of his ideas, Lexer cites the well-known fact that X-ray pictures taken after plating operations for fracture often show plenty of callus on the side opposite the plate and very little on the same side. He says that in the usual operation the soft parts are first separated from the periosteum-covered bone (thus depriving the periosteum of its main blood supply); after this the periosteum is divided, pushed aside, and the bone thus exposed. On the side of the bone opposite the wound the operator can not reach the tissues except with much difficulty. Hence the periosteum-soft part relationship is not disturbed and the subsequent nutrition and repair are much less hindered.

I shall not speak of Lexer's application of this principle applied to the treatment of non-unions. Those interested in the subject will be amply repaid by reading the original article in the *Deutsche Zeitschrift fur Chirurgie*, Vol. 133, p. 170.

A procedure which facilitates the freeing of fragments at open operation preliminary to their reduction is to kink the limb at the site of fracture (a bone hook is inserted into each fragment and they are pulled apart as freeing goes on and angulation is increased). In the case of the femur, the leg and lower half of the thigh are allowed to drop over the side of the operating table so that finally the two fragments of broken bone project from the wound practically parallel to each other. In this way the soft tissues situated on the far side of the fracture (the side opposite the operative wound and covered by the bones in the normal position), are exposed and dissection and control of hemorrhage are rendered safe and easy.

After exposure and adequate freeing, complete reduction may be accomplished by external traction with the Hawley table, the Lemmon table, the Lambotte perineal crutch, or by some procedure within the wound, applying a suitable clamp (Lowman, Lambotte or similar type) to each fragment. Now, on the one hand, if the fracture is a recent transverse one, the fragments are kinked until they can be freely moved, their corresponding edges are coapted and the fragments are then straightened out. On the other

hand, if the fracture is oblique, the clamps on each fragment constitute fixed points against which turnbuckles may exert distraction until reduction is accomplished and immobilization is assured by the application of a plate, bone graft or other fixation method.

A number of modifications of the turnbuckle method have been put on the market. Most of them have the inherent mechanical defect that the distracting mechanism is set half way up the shaft from the bone. This subjects the mechanism to enormous bending strains as soon as force is applied. On the other hand, if the distracting force is applied close to the bone, these strains are minimized.

IMMOBILIZATION AFTER OPERATIVE REDUCTION

Both Lane and Lambotte immobilize femoral fractures for a period of a week or so with the knee in acute flexion — the heel touching the buttock—using bandages and gauze, but no plaster. At the end of this time—as soon as the skin has healed — a temporary splint is applied and daily massage and passive motion are begun. This is a more reasonable treatment than the customary six weeks' immobilization in plaster, for it certainly favors better nutrition of the tissues. Lexer, the foremost advocate of operative reduction of fractures in Germany, is opposed to plates. He uses bone grafts exclusively. He begins massage and passive motion during the third week.

COMPOUND FTACTURES

The commonly seen fracture of this sort in which the skin is barely broken, if promptly treated,—cleansed, flooded with iodin, reduced and immobilized,—usually heals without suppuration.

An entirely different problem presents itself in the compound fractures filling the military hospitals of Europe. Contrary to expectation, the so-called first aid measures (iodin and dry sterile gauze) proved of practically no value for preventing suppuration in wounds which were extensively contaminated. The only way to prevent a fatal sepsis was to establish free drainage by a most thorough and radical revision of the wound, so that all gross foreign matter was removed, and every nook and cranny was widely opened. At the first aid stations all they can do is to immobilize the limb (most of the modern armies have excellent skeleton splints for this purpose) and prevent further contamination of the wound. The revision and establishment of drainage is to be done in an operating room, preferably under general narcosis.[1]

One requisite of the Carrel-Dakin method is that a competent chemist make up the solution fresh every 3 to 7 days. If this is not feasible, an excellent antiseptic solution is that used by Mayer, a surgeon in the French army. According to D. H. Stewart, of New York, this is made up in two stock solutions: one contains chlorinated lime 1 part, acetic acid (6%) 20 parts; the other contains Epsom salts (Mag. Sulph. 2 parts, water 20 parts). Equal parts are mixed when needed.

The shortening present in bad compound fractures is best overcome by nail extension or one of its modifications. The report of Hey Groves,[2] of Bristol, England, is of interest in this connection. His series comprised 60 compound fractures of the femur, all septic. They reached him at least one week after injury. Six died. In 75% of the 54 remaining, he was able to obtain good function and no shortening by means of nail extension which he calls transfixion. It is rational that the less one disturbs septic tissues, the better. Hence metallic extension is to be preferred to plating operations in septic cases.

THE TREATMENT OF MAL UNIONS

is undergoing great changes. Let us suppose there is a fracture which has consolidated and in which the shortening amounts to two and one-half to three inches. Formerly, what did the surgeon do? He cut down upon the fracture and found the upper end of the lower fragment so soft and cheesy that he could pare it with a knife; the contraction of the soft parts was so well established

1. Since the reading of this paper it has been the writer's fortune to hear at different times from Drs. H. H. M. Lyle, Charles Powers and George Hawley concerning the Carrel-Dakin sterilization of wounds. There can be no doubt that the few men who actually follow every minute detail of this treatment have been able to obtain the same excellent results as its originators. It is the method of the future in traumatic surgery,—in fact, in the treatment of all suppurations.

2. Hey Groves: British Journal Surgery, Vol. III, No. 12, April, 1916, p. 606.

that to completely overcome it during the limited time at the operator's disposal would have required a dangerous amount of force with probable harm to arteries, nerves or muscles. Hence the surgeon had to content himself with resecting enough bone from both stumps so as to properly align the now shortened fragments; and the patient had a permanent shortening. Nowadays, with nail-extension at his disposal, the surgeon exposes and re-establishes the fracture. He then closes the wound and by means of the powerful traction furnished by nail-extension, is able to overcome shortenings of as much as 11 cm. within a week or ten days. With the limb again at its proper length, consolidation generally takes place. Even should there be non-union, this can be remedied by subsequent bone grafting.

CASE REPORT

The following case illustrates this point:

A boy of 13 came to me four months after having sustained a transverse fracture of the middle third of the femur with a shortening of between 2½ and 3 inches. There was solid union. The fragments were chiseled apart and nail-extension was applied, using 25 pounds traction. Within 17 days the shortening had been overcome. At the end of four weeks there was some callus, but no union. A plaster cast was accordingly applied to the limb, leaving fenestrae around the nail ends. It was divided opposite the site of fracture and by means of Hackenbruch clamps the distraction of the fragments was maintained. The nail was then removed and the nail holes healed kindly. At the end of 9½ weeks there was a firm consolidation with a huge callus. He was accordingly discharged from the hospital with an ambulant splint and told to report weekly or oftener. There was no shortening at the time. He neglected to report for eight weeks; in fact, not until a police officer called at his house. He then had developed an external angulation. The parents refused any operative correction, but permitted him to be sent to an orthopedic hospital in the country. He returned six months later with firm union and ½ inch permanent shortening. In spite of the patient's own neglect, the result was a distinct improvement over the original condition. This case indicates that in nail-extension we have a method for overcoming shortenings of long standing in old malunions, without danger of trauma to the soft parts, by virtue of continuous traction. This is much more effective as well as much safer than the necessarily sudden, brief distractions at open operations.

IMPROVISATION

Numerous methods of applying traction directly to the bone by means of some metallic contrivance are in existence. In addition to the Steinmann method, the Ransohoff-Syms ice tongs, the appliance similar to this evolved by Hey Groves (almost identical with an illustration in the front of Steinmann's monograph), the calcaneus stirrup of Finochietto (used with great success by Chutro, the Argentine surgeon who has made such a brilliant name for himself by his work in Paris), have all proven of unique value in the hands of competent surgeons. If one does not have the regular outfit at hand, it is not difficult to improvise with long steel drills or with a light pair of ordinary ice tongs such as I have seen applied in a case of femoral fracture by Dr. Martin Ware, of New York.

AUTHORS' ABSTRACTS

Military, Railway and Emergency Surgery

Remarks on the Treatment of Burns with Paraffin Mixtures as Developed by the Experience of the Present European War. Rudolph Matas, New Orleans, La. New Orleans Medical and Surgical Journal, Vol. 69, No. 10, April, 1917, p. 677.

In so far as there has been so much written in the lay and medical press, giving glowing accounts of rapid recoveries with the "Ambrine" treatment since it was introduced by its originator, Dr. Barthe de Sandfort of Issy-les-Moulineaux, a review of the subject is of timely interest.

The observations of Major A. J. Hull, of the Medical Corps of the British Army in France, confirm the claims made for Ambrine, which is essentially a paraffin compound.

1. Burns heal with rapidity.
2. Constitutional symptoms rapidly abate.
3. Pain is reduced to a minimum.
4. Scarring appears to be obviated to a far greater degree than with other treatment, or is not apparent.
5. The need for grafting large burns appears to be avoided.
6. Patients free from sepsis.
7. Mild cases heal quickly and severe cases recover, which would have been unlikely by the ordinary methods of treatment.
8. Paraffin method superior to the older methods.

The excellent results obtained would appear to be due to mechanical causes: the protection of the burn from the air, protection of the recently-formed granulations from damage, the splint-like effect of the wax in holding the damaged tissue immobile and at rest. The heat of the applications and the conservation of heat to the surface may encourage the lymph flow, determine the supply of blood to the new capillaries and favorably affect healing.

The relief from pain and the rapidity of healing is due to the fact that the burn is held at rest

in a plaster like cast of paraffin and a suitable nidus in which the epithelium will proliferate is provided.

The paraffin treatment is begun at the first dressing, the burn is washed with sterile water or boric acid solution and dried with an electric hair drying apparatus. This last is not necessary, and simply fanning or drying the surface with gauze will do. The burn is covered with a thin layer of paraffin at a temperature of 50° C., using a cotton mop as an applicator. A thin layer of cotton the size of the burned area is then applied, over which another layer of paraffin is used. The dressing is completed by applying cotton and bandage.

The burns are usually dressed daily; in the latter stages when there is little or no pus the dressing is changed every forty-eight hours. Blisters are not interfered with at the first dressing. At the second dressing the dead layers of skin are cut away. Sloughs usually separate after a few dressings.

Hull experimented with a number of formulas as substitutes for the original paraffin compound known as Ambrine, and concluded that the following is as good if not better than the original patented preparation.

Formula for No. 7 paraffin (Hull):

Resorcin	1%
Eucalyptus oil	2%
Olive oil	5%
Paraffin, soft	25%
Paraffin, hard	67%

Betanapthol may be substituted for the resorcin as follows:

Betanapthol	0.25%
Eucalyptus	2.0%
Olive oil	5.0%
Paraffin, soft	25.0%
Paraffin, hard	67.75%

Dr. Matas was the first to experiment with the paraffin in New Orleans and adopted Hull's formula No. 7, prepared with betanapthol, with excellent results. His experience at the Charity Hospital and Touro Infirmary impress him with the belief that the paraffin dressing as above described is the best treatment for burns.

AUTHORS' ABSTRACTS

Surgery, Gynecology, Obstetrics and Genito-Urinary Diseases

(Continued from page 495)

A Radical Cure of Osteomyelitis of the Ribs. Emil G. Beck, Chicago, Ill. Illinois Medical Journal, Vol. XXXI, No. 2, February, 1917, p. 107.

The author reports his experience in the treatment of chronic suppurative diseases of the sternum and ribs, citing 16 cases treated, each case having been previously operated upon without beneficent results, some cases as many as fifteen times, usually consisting of a blind curettage.

He first tried the most conservative treatment, namely, the injection of bismuth paste, and found that a certain percentage of these refractory diseases would yield readily to it. Whenever this method did not prove successful, he went to the other extreme and resorted to the most radical operation, under the guidance of stereoscopic radiograms of the injected sinuses, which invariably demonstrated the extent of the disease and enabled him to eliminate every vestige of the affected tissues.

After he had determined exactly which ribs or what part of the sternum were diseased, he made a most adequate curved-skin flap incision, which exposed a very large area and under ocular inspection resected every vestige of the diseased bone. Then instead of closing the cavity by sutures, as was customary, he left the cavity entirely open, gaping, and packed it with gauze. In the deepest recess of the wound the skin flap is placed and gauze packed against the outer surface of it, so that it may cover and line a part of the cavity. He never employes any suture material in the skin, but allows the surfaces to heal by granulation; and after the granulations have sufficiently formed, the margins of the skin and the granulations are covered with adhesive plaster strips. This procedure is quite effective in producing epidermization of the granulating wound, the epithelium growing rapidly from the edges of the skin toward the center.

The main objects in planning the operations were, *first*, to expose the diseased area by an adequate incision; *second*, to take away every vestige of the diseased tissues under the guidance of the eye; *third*, to close the wound in such a way as not to permit any dead space in the resected cavity; *fourth*, to use no suture material whatever except ligatures for arteries, and leave the wounds widely gaping; and *fifth*, to reproduce epithelium of granulating surfaces without skin grafts.

The author objects to the use of the probe as a diagnostic agent in tuberculosis of the ribs. He also deprecates the blind curettage of suppurative sinuses in the ribs, on the ground that the surgeon does not know the extent of the disease and may curet even in the wrong direction, as he has proven for himself in many instances.

The Sensory Evidence of Nerve Regeneration. Isador H. Coriat, Boston, Mass. The Boston Medical and Surgical Journal, Vol. CLXXVI, No. 6, February 8, 1917, p. 192.

The nerve supply of the skin is not only different for the various receptors for pain and touch, but each of these regenerates at varying periods after a primary or secondary nerve suture. The time necessary for the beginning of the regenerative processes varies, although definite evidence of regeneration could be found within less than a month after suture of a nerve.

The best evidence of regeneration, both from

(Continued on page 525)

EYE, EAR, NOSE AND THROAT

THE END RESULTS OF 111 RADICAL MASTOID OPERATIONS*

By J. A. Stucky, M.D.,
Lexington, Ky.

Fifteen years ago, when the general practitioner was not fully converted to the belief in the necessity of the radical mastoid operation, I was frequently asked, What is going to be the end result five or ten years after the operation? I determined then that I would ascertain and publish the results observed in my own work. I have been trying to get in touch with my cases for nearly two years. These cases have come from different parts of the State in which I live and some of them I have never seen after they left the hospital, and I have only been able to get a report of their condition from the family doctor.

Unfortunately, no accurate record of hearing was made before the operation except in a very few cases. In some of my very chronic cases the pathological condition had almost completed the radical operation and there was very little to do except to remove the loose pieces of dead bone and granulations and put the ear in a condition most favorable to recovery. Many of the cases came from remote districts and some of them could give no accurate history of the disease. Of the one hundred and eleven cases referred to in this report I was able to see personally only 65 within four or five years after the operation.

While the radical mastoid operation for the cure of chronic suppurative otitis media, suppuration in the mastoid cells, lateral sinus thrombosis, extra- and intra-dural abscess, has always been regarded as one of the greatest advancements made in otology, and a major operation requiring skillful knowledge and faultless technique, the question was often asked, when so many of these operations were performed, What will the end results be? By diligent and persevering effort I have been able to ascertain the present condition of one hundred cases, none of which was operated upon less than five years ago. The cases are not selected ones, but are taken at random from my case record.

The questions considered are:

1. As to chronic discharge,
2. As to the hearing, and
3. As to general condition of health.

In all the cases but 11 there was complete cessation of the discharge of pus. In these 11 cases there was occasional recurrence of discharge of muco-purulent material from the lower tympanic cavity, the result of a patent or patulous Eustachian tube.

It is impossible to state the length of time required for the covering of the large cavity by a vascular fibrous membrane or dermatization; in the majority of cases the patients were dismissed with a home treatment before this occurred. The 11 cases reported that every three or four months the ear would block up completely and require cleaning out of an accumulation of cerumen desquamated epithelium and muco-purulent secretion. These cases were those having either a patulous Eustachian tube or cholesteatomatous formation. The duration of the otorrhea before the operation varied from one to thirty-two years.

Nineteen cases reported a slight improvement in the hearing.

Sixty cases reported the hearing neither better nor worse.

Twenty-one cases were sure that the hearing in the operated ear was worse. All of these cases reported complete relief of all head symptoms and greatly improved general health.

In 3 cases I found a small opening in the horizontal semi-circular canal, the result of long-continued caries. Strange to say, in none of these has this condition increased; and while they still have attacks of vertigo, the discharge of foul pus has ceased and they have been restored from invalidism to an average of health and strength.

While the discharge has not ceased in every case, and though the hearing in a few cases is more impaired than before the operation, I have never seen an intra-

*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916.

cranial complication develop after a radical mastoid operation has been performed. My observation agrees with those of S. Macuen Smith—"almost without exception these patients improve in general health, it being not uncommon, in cases where the chronic otorrhea was of a number of years' duration, for the patients to state that they had never before realized what robust health really was." The radical mastoid operation should be regarded as a major procedure, especially when we consider the opportunities for causing irreparable injury. This operation is not only safe in the hands of competent operators, but is usually productive of a maximum amount of good. It is frequently the first step for relief of an intracranial lesion, and if a chronic otorrhea has its origin in the mastoid antrum or lower cells, it can only be relieved, as a rule, by a radical mastoid operation.

DISCUSSION

Dr. W. Likely Simpson, Memphis, Tenn.—It seems to me in listening to this paper that it is rather remarkable the results that Dr. Stucky has had. For instance, he is certain no complications have arisen from the operation for chronic mastoiditis. I believe his paper stated the operations were done over a period of a good many years, and it seems to me that necessarily some of those operations must have been done on cases where there was a labyrinthian suppuration, probably not only chronic, but acute. And knowing this, it is very remarkable he did not get cerebellar abscesses and meningitis in some of his cases.

Another point I would like to speak of is the hearing results. I believe that the results would probably have been better if the radical operation had not been done, but, instead, the Heath operation had been performed in these cases of chronic suppuration in the middle ear, where there was a small opening in the drum. I do not believe that one is justified in doing a radical mastoid for a chronic suppuration in the middle ear, even though it has extended over a long period of time with only a small perforation in the drum, if the hearing is quite good, no cholestatoma, etc., present. I believe instead of a radical operation the Heath operation is indicated.

Dr. Stucky (closing).—The doctor asked about the labyrinthian involvement. Remember, I tried to emphasize in my paper that this is a report of cases operated upon five years and more ago. I have had several cases of labyrinthian disturbance, markedly so. There were several cases of facial paralysis, but they got well, and at the end of five years they had none or very little labyrinthian disturbance, and they had no facial paralysis. I have had cerebellar abscesses and abscesses of the frontal lobe, and sinus thrombosis. They died. All of my patients do not get well, so I could not report the end results.

The Secretary asked a question about facial paralysis. I have had, I think, 19 cases that were brought in that had facial paralysis of varying degree before the operation, but they finally cleared up very nicely. I have never had a case of permanent facial paralysis.

THE TECHNIQUE OF TONSIL EXCISION WITH EXHIBITION OF INSTRUMENTS*

By M. M. Cullom, A.B., M.D., F.A.C.S., Eye, Ear, Nose and Throat Surgeon, City Hospital; Surgeon to St. Thomas Hospital,
Nashville, Tenn.

The flood of literature relating to the tonsil which has submerged the conscientious medical worker for the past six years is a matter of wonder to many. To my mind it is only a tribute to the importance of the subject. An intimate knowledge of no organ in the body has been followed by a greater revolution in medical thought and practice.

Great as has been the addition to our knowledge, and as numerous as have been the problems solved, I think we have only scratched the surface in our studies of the question of focal infection. To my mind, focal infection is destined to explain many conditions which are now obscure, and hold out the promise of hope to those who have lived in despair. Therefore, no apology can be considered necessary for the discussion of an organ which plays such a sinister part in the drama of human suffering, and whose surgical treatment is fraught with such momentous results.

Let us revert a moment to the days when the tonsillotome reigned, and indications were fulfilled by removing a portion of the gland and leaving the rest "to atrophy."

The methods of removal and the means for controlling hemorrhage were both crude. That accidents were not more frequent was no doubt due to the fact that most patients operated on were children.

Doubtless many patients bled to exsanguination and had to go through a

*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916.

tedious period of convalescence. Such crude methods would be out of place in this day, because fully as many adults as children are operated upon now, and a great many patients are in a state of ill health as a result of focal infection from the tonsil. Some of them have high blood pressure, others have organic heart lesions, others are frail and anemic, making it of the utmost importance that no unnecessary amount of blood be lost. These factors and many others contribute to make the modern tonsil operation a much more complicated affair than the simple tonsillotomy of a few years ago.

The conscientious surgeon must be prepared not only to deal with the average simple case of tonsillectomy, but must be ready to meet any emergency arising as a result of focal infection. No man who removes tonsils in accordance with modern indications can hope to escape entirely facing those situations which appall the stoutest heart; and only the consciousness that he is prepared for any emergency enables the surgeon to embark upon the operation with a sense of security.

The technique of the operation under general anesthesia will be discussed first, the technique under local anesthesia later.

What are the factors which enter into a properly safeguarded operation upon the tonsils under general anesthesia?

The first consideration is the anesthetic itself. For general anesthesia, ether has proven itself the safest anesthetic. The chapter of fatalities following the use of chloroform has caused the careful surgeon to eliminate chloroform anesthesia in operations about the air passages. Gas, too, has been found unsuitable in such operations except as a preliminary to ether.

Anesthesia may be induced in any of the ordinary ways by the open method or the closed, but it is important to induce anesthesia to a point of complete relaxation, otherwise the mouth can not be opened sufficiently wide and the patient is liable to "come out" partially and cause trouble and delay.

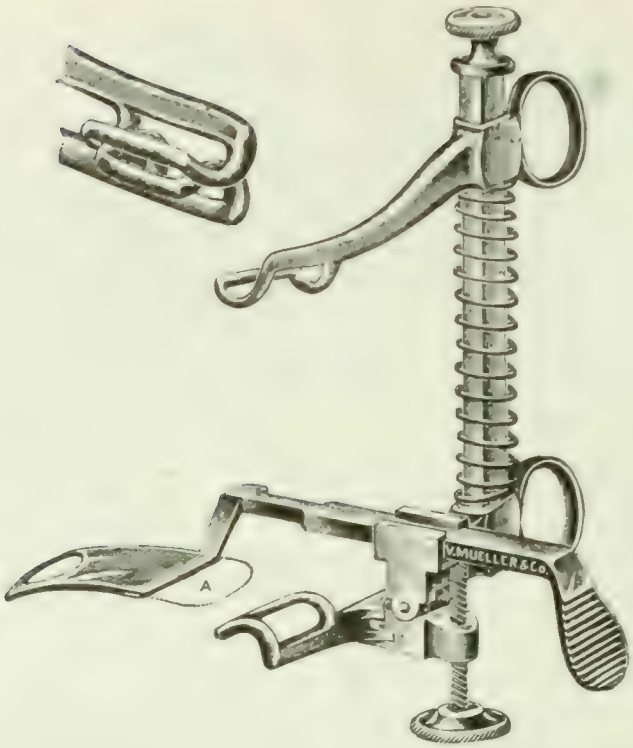
The matter of great importance is to have some form of apparatus which will maintain a sufficient degree of anesthesia to permit the surgeon to proceed calmly and carefully about his work, without undue haste.

The simplest and most satisfactory apparatus in the hands of the writer is the Caine-McDermott warm vapor apparatus. Many good men claim that a special apparatus is not necessary, and that the ordinary open method of anesthesia is sufficient. For the ordinary, average case this may be true, but when one has become accustomed to the comfort of operating upon a patient sleeping quietly, a change to the old method is decidedly disconcerting. But it is not the average case that the careful surgeon is preparing himself for. Take the patient who is difficult to keep asleep at best, add to this a furious hemorrhage that shows no tendency to spontaneous arrest. Think of trying to deal adequately with a condition of this kind upon a struggling, half-awake patient. It is under circumstances of this kind that the careful surgeon breathes a prayer of thankfulness for the aid rendered by a dependable ether vapor apparatus. Not only are such situations more dangerous for the safety of the patient, but they are mortifying to the pride of the surgeon.

The next factor of safety and efficiency is a plainly visible and easily accessible field. Visibility is obtained by a good electric headlight worn on the forehead. Reflected light is also available, but is less convenient and more troublesome of manipulation.

Visibility and accessibility are intimately bound up with an adequate exposure of the field. Men meet this problem in different ways, but most of them by means of a tongue depressor in the hands of an assistant. That this is an unsatisfactory way can be readily appreciated by noticing how the tongue depressor slips from side to side, owing to the inability of the assistant to see the field, and the consequent irritation of the surgeon who has to be continually asking for the position of the tongue depressor to be changed. It also requires an extra assistant in the field.

Another method is to use a mouth gag with a tongue depressor attached. This is the ideal way if it can be worked successfully. In all mouth gags with tongue depressor attached, except the one devised by the author, the tongue depressor is attached in the centre. The effect is that it depresses the tongue and crowds it down upon the larynx and interferes with



Author's mouth gag with tongue depressor attached. It lifts the base of the tongue instead of depressing it and aids instead of impeding respiration.

respiration. They only admit of a vertical adjustment and do not allow the alternate exposure of the tonsils. A number of gags of this type have been devised, and if only a gag had been devised with an attached tongue depressor there would have been no occasion to devise a new one. In the mouth gag devised by the writer two new principles are successfully incorporated. The tongue depressor is attached on the side, leaving a space between the teeth and the depressor through which the tongue can ascend. The point of the depressor is applied to the base of the tongue, and exerts a lifting force, and aids respiration instead of impeding it. The other principle is a lateral as well as a vertical adjustment, allowing alternate exposure of the tonsils. Another feature of great value is that there is complete exposure of the field. There is nothing to interfere with the working space inside the mouth. The problems of visibility, accessibility and complete exposure of field having been solved, a long step has been taken toward a thorough and satisfactory operation.

Author's tonsil grasping forceps.

The next step is the selection of a satisfactory tonsil forcep for grasping the tonsil. The essentials of a good grasping

forcep are five, namely: it shall take a deep and firm hold on the tonsil; it shall not tear out; it shall be manageable with one hand; it shall offer as little interference with sight and working space as possible; it shall permit the loop of the snare to slip over it without releasing its grasp. The forceps I have devised fulfill these requirements. The hinge is in the end like a pair of calipers, and when closed the two arms come together like a single rod and make the minimum interference with the maximum of strength and grasping power.

Author's tonsil dissector. Five instruments in one handle.

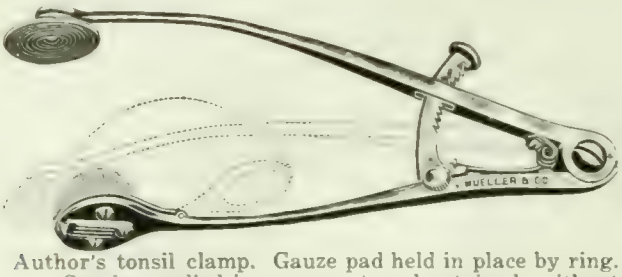
The next essential is a dissector. The requirements for dissection of the tonsils are met by instruments which are pointed suitably curved for dissecting the tonsils free of its attachments to the pillars. The knife I present for your inspection has a sharp-pointed knife for piercing the mucous membrane, a double-edged curved knife for circumcising the tonsil, and on the other end a double-bladed knife set at right angles to the shaft, so that it gives a right and left knife on the same shaft. It is in effect five instruments in one handle, giving the surgeon every instrument needed in the thorough dissection of the tonsil.

The patient being in the proper stage of narcosis, the mouth being propped open and the tongue being properly retracted, the surgeon stands on the right and an assistant on the left of the patient. The assistant is provided with a supply of sponge forceps, which are refilled as fast as required by a second assistant standing back of the first assistant. The surgeon grasps the tonsil in its long diameter, inserting one blade in the supratonsillar fossa, the other in the base. He bites deeply into the substance of the tonsil so as to get a firm grasp. He lifts the tonsil from its bed and at once learns a number of things about it. He notes its shape and contour, whether it is firmly or loosely attached, whether its attachment is superficial or deep, whether it has been the seat of inflammation resulting in adhesions. A tonsil that has been the victim of recurrent peri-tonsillar abscess becomes bound down to surrounding structures to such an extent as to feel immovable when an attempt is made to lift it from its bed. Such a tonsil is very difficult of dissection and often has to be removed piece-meal. The trained surgeon knows instantly upon lifting the tonsil whether removal will be easy or difficult.

The tonsil being lifted from its bed, the tissues are put on a stretch and the incision is begun where the mucous membrane joins the faucial surface of the tonsil. The sharp point of the knife having been inserted through the mucous membrane, it is swept up over the supratonsillar region and down the anterior margin of the posterior pillar. The angular knife is now introduced into the original opening and swept downward along the anterior margin of the anterior pillar, the object kept in view being always to preserve every particle of the mucous membrane. The tonsil is now completely circumcised except at its base. The angular knife is now turned upward and the anterior pillar freed. The supratonsillar region is next attacked and the superior pole of the tonsil freed down to its attachment to the constrictor. This is the most important part of the dissection and the most difficult. The attachments are firmer in this area even when not complicated with adhesions, and unless the dissection is complete it is likely that the tonsil will not be removed in its entirety. Some good men carry the dissection down onto the constrictor so that when they are ready to apply the snare the tonsil is hanging only from its base. I do not consider this necessary, as I think the snare removes the tonsil more cleanly and smoothly than knife dissection. It must be said, however, in its favor that there is less likelihood of leaving a portion of the base. Justin Mathews, of Mayo's clinic, is exceedingly skilful in this method of dissection.

The tonsil is now ready for the application of the snare. The kind of snare used is a matter of importance. The

writer has been all through the snare proposition, and has settled down to a heavy powerful instrument. The earlier snares devised for tonsil work were too light. After having snares bend in my hands, and after encountering tonsils which were removed with the utmost difficulty, the writer discovered that what is wanted is a snare of heavy construction, so made that the strength of the surgeon can be utilized to the utmost. This is accomplished in a snare of the pistol grip type, and the one I have found most satisfactory is the Brown snare. It is a heavy, powerful instrument of simple construction with practically nothing to wear out and nothing to get out of order.



Author's tonsil clamp. Gauze pad held in place by ring. Can be applied in a moment and retained without discomfort.

The tonsil being removed brings us to a most important step of the operation, namely, the control of the hemorrhage and the conservation of blood. If there is anything that the writer has learned through experience, it is the importance of controlling hemorrhage, and permitting no drop of blood to be lost unnecessarily

The tonsil operation should be as near bloodless as it is possible to make it. When the first tonsil is removed the assistant applies the writer's tonsil clamp, which effectually controls the hemorrhage and permits the surgeon to proceed at once to the removal of the second tonsil. This shortens the time of the operation at least five minutes. When the second tonsil is removed the assistant thrusts a sponge on a sponge forceps into the fossa and holds it until the first rush of blood is over, usually from one to three minutes. Then the surgeon inserts a pillar retractor under the margin of the anterior pillar, gives it to the assistant to retract, and takes the sponge forceps in his hand. In the other hand, he takes a pair of Jackson tonsil hemostat forceps. He cautiously moves the sponge about in the fossa, uncovering the bleeding points one at a time. As a bleeding point appears it is grasped with the forceps. There is usually only one point that shows a tendency to bleed after the pressure of the sponge forceps has been relaxed. This point is usually in the supratonsillar fossa or in that neighborhood. But there is no one point to which excessive hemorrhage is confined. Spurting arteries are encountered in all parts of the fossa as well as profuse venous bleeding. The points of greatest frequency are first the supratonsillar fossa, embracing the upper third of the tonsillar fossa and second the region of the inferior pole. The most troublesome point to deal with is the base because it is difficult to retract so as to bring into the field of vision and is also the most difficult point of access. For reaching this the author's curved hemostats have been found very useful.

After a bleeding point has been caught with the forceps they are left in place for a minute or two. If, on removing them, hemorrhage persists, they are reapplied and left on longer. It is seldom in the experience of the writer that it has become necessary to ligate a bleeding point, even where the hemorrhage has been profuse and alarming. After all hemorrhage has been checked in the second fossa the clamp is removed from the first and the same steps pursued as in the second. While the first fossa is often found dry upon removing the clamp, it is by no means infrequent to find profuse bleeding set up upon removal of the clamp, showing that pressure alone is not sufficient to control hemorrhage unless maintained for a long period.

The above constitutes the steps in the average case, but it is the unusual case for which we have made our preparations. Sometimes most unexpectedly the removal of the tonsil is followed by a rush of blood truly alarming. Three sponges upon sponge holders may be crowded into the fossa with force before any diminution in the rush is noticed. Oftentimes this furious hemorrhage is brief, and is soon checked by pressure. Again the slightest relaxation of pressure is followed by the same furious hemorrhage. We know then that we are dealing with one or more large vessels which will try our mettle. It is then we feel thankful for an apparatus for maintaining continuous anesthesia, a trained anesthetist, a good light, a trained assistant and an apparatus that will hold the mouth open and retract the tongue. When the sponge is lifted from the fossa there is such a furious rush of blood that the fossa is instantly filled, and it is impossible to locate the bleeding point. Now we are put to it. Experience has taught me a ruse which has stood me in good stead on several occasions. Two sponges are thrust into the fossa, one above, the other below. First one is raised and then the other and we learn whether the bleeding is coming from the superior or the inferior portion of the fossa. Having been localized to this extent, the sponge is moved cautiously, gradually exposing the bleeding area, until the vessel is located and caught with the forceps.

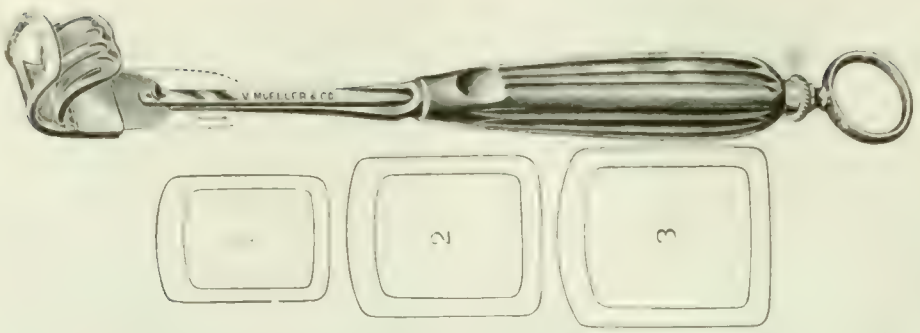
The writer learned this lesson from a case where the bleeding artery was located in the supratonsillar fossa. It spurted downward and struck the inferior portion of the fossa with such force that it jetted up exactly like a spurting vessel at that point. Fruitless efforts to seize it were most puzzling and discouraging. I have since encountered two cases which behaved similarly, but my first experience taught me how to deal with them.

When the hemorrhage persists after pressure and clamping with hemostats does not control, ligation must be resorted to. The writer has had occasion to do this a few times, but has never done so where the above measures have stopped the bleeding. I may add that no case of secondary bleeding has supervened upon a failure to ligate. The writer has never had to suture the pillars. When all hemorrhage is controlled and the fossa absolutely dry, then it is the custom of the writer to paint the fossa lightly with a saturated solution of iodin in beechwood creosote. This is followed by a liberal painting of the surface with glycerite of tannin. I wish it understood that these agents are not applied with any idea of controlling any existing hemorrhage. I wish to be thoroughly understood that my belief is that the control of tonsillar hemorrhage is surgical, and not topical. I have reason to think, however, that this application seals the vessels already closed and exercises a strong influence toward preventing delayed hemorrhage. I am led to think this by very great reduction in delayed bleeding following removal of the tonsil under local anesthesia. In removing tonsils under local anesthesia in which adrenalin was combined, my percentage of delayed bleeding was large. Since using the above procedure delayed bleeding has practically disappeared from my operations, except in cases of high blood pressure, where occasional after-bleeding takes place.

The combination of iodin and beechwood creosote is a good preventative for infection which might set up following the operation.

The technique of tonsillectomy under local anesthesia is growing rapidly in favor because of the innate dread of taking a general anesthetic, and because it eliminates the fee of the anesthetist and the hospital charges.

Patients for operation under local anesthesia should be carefully selected. Children, of course, are not suitable. Where an occasional child might submit, the majority would become panic-stricken and cause a distressing scene. Timorous, nervous adults would much better take a general anesthetic. The preference of the patient should be respected. I have observed that a patient over-persuaded is much more likely to break down than one who has made up his own mind to take the local anesthetic. There are also those who have such sensitive reflexes that, no matter how profound the local anesthesia, the slightest manipulation in the throat causes uncontrollable retching and vomiting. With a suitable patient the opera-



Author's adenotome.* A hinged basket allows the instrument to settle snugly around the growth. A flexible blade cuts from behind forward, preventing stripping down of the mucous membrane. The growth is then swept out as with the ordinary curette.

tion under local anesthesia is very satisfactory.

The writer paints the throat at intervals of five minutes for three or four applications with an 8 % solution of cocaine, not only the tonsil, but the pharynx, uvula and base of the tongue. A preliminary hyperdermatic injection of 1-150 of a grain of atropine is given, to control as far as possible the flow of saliva. If the patient is nervous, an eighth of a grain of morphia is added to the above. It is unusual, however, that this is indicated.

After the induction of superficial anesthesia each tonsil is injected with five centimeters of a 1 % solution of novacain to which a few drops of adrenalin has been added. The solution is injected at perhaps six points, particular attention being paid to the supratonsillar region and base of the tonsils. Two points are injected in the supratonsillar region, two at the base of the tonsil and one about the middle of the anterior pillar and one about the middle of the posterior pillar. When the injection is finished the tonsil is surrounded by a ring of sub-mucous solution.

Only one assistant is required, if one uses the ordinary operating chair with a headrest. The assistant stands at the left of the patient to depress the tongue, hand instruments and sponges. The urgent need in the operation is a powerful snare that will cut through the toughest tonsil at one strong pressure.

The division of the tonsil attachment by the snare is practically the only pain experienced by the patient, and it is of the utmost importance that it be over as quickly as possible.

There is the same necessity to check all hemorrhage as under the general anesthetic. Owing to the use of adrenalin the hemorrhage is much less than under a general anesthetic and for that reason we are inclined to disregard it, but for that very reason the tendency to after-bleeding is greatly increased. When the constricting effect of the adrenalin upon the vessels is replaced by relaxation, after-bleeding is very apt to occur.

Indeed, after-bleeding occurred with such frequency in my early operations under local anesthesia that I came to expect it in about 50 % of cases and sought to avoid operations under local anesthesia wherever possible. It was then I hit upon application of a saturated solution of iodin in beechwood creosote, followed by an application of glycerite or tannin. As I have said before, this is not applied until all hemorrhage is checked, for it is not applied with any notion of checking existing hemorrhage. It seems to seal the mouths of vessels already closed, and to counteract the secondary relaxation which follows the use of adrenalin.

The effect was soon apparent, and I have grown to feel as secure from after-bleeding in patients done under local as those done under a general anesthetic.

The lesson my experience has taught me is that tonsillectomy is a major operation, but often undertaken with minor precautions. There are many men who

*While the adenotome is not referred to in the paper, its use was demonstrated in the author's tonsil and adenoid clinic conducted before the Section.

think that the precautions I insist upon are elaborate and unnecessary. You will often hear a surgeon say: "Oh, it is only a trifling hemorrhage; it will take care of itself." In the average cases this is true, but there are cases where a slow oozing will go on for hours without attracting attention, and the first thing that brings it to notice is when the patient vomits an enormous amount of blood, and the necessity arises of controlling hemorrhage in a patient weakened from exsanguination and panic-stricken by the thought of hemorrhage. And occasionally even the vomiting does not take place, but the case passes quietly on to a fatal termination.

We should take a lesson from the general surgeon, who insists that no cavity be closed until every bleeding point is checked. What surgeon who values his mortality statistics is going to take a chance with concealed hemorrhage? The position of the throat surgeon is precisely similar, and let us be in no particular behind our confreres in endeavoring to secure the safety of our patients.

208-214 *Hitchcock Bldg.*

EDITOR'S NOTE.—Discussion follows the next paper.

ADVANTAGEOUS RESULTS OF THE TONSIL OPERATION*

BY J. G. MURPHY, M.D.,
Wilmington, N. C.

My coming before you with a paper on this subject is evidence in itself that the attitude of the profession is not settled toward this important branch of surgery. If a paper were presented to this society on Advantageous Results of the Adenoid Operation, my audience would sigh and settle in their seats till I should finish what they would consider superfluous iteration. After a very careful review of the literature on tonsil work, I am very glad to report to you that it appears the time is not far off when there will be universal recognition of the importance of this work not only by the specialists in this branch, but by the men practicing general medicine and surgery. I shall not discuss the other phases of tonsil work, but my chief aim in this paper is to bring before you for your thoughtful consideration what it has been my privilege and pleasure to observe of the good results of the tonsil operation.

As to the function of the tonsil. If it has any, it undoubtedly has performed it by from the sixth to seventh year and is not missed after this. In fact, it is often better out than in.

No theory yet advanced for a useful function of the tonsils can withstand the preponderance of the evidence that accumulates for every thoughtful physician from day to day of the advantageous results of being rid of the tonsils where there arises a cause for their removal. In no case, on physical examination, can we say with certainty that a tonsil is not diseased, for the diseased areas are usually at the bottoms of the crypts. In my experience it is not the hypertrophied tonsil that is the greatest menace to health, but rather the atrophied, embedded ones where there is an increase of fibrous tissue and a corresponding diminution of lymphoid structure with adhesions to the anterior and posterior faucial pillars. The inoffensive looking tonsil is usually the most dangerous and deadly. Sore throat is rarely ever complained of in cases where there is a chronic focus of infection in the tonsil.

Only to get all the evidence in presenting my case do I mention that in referring to the tonsil operation I mean a thorough tonsillectomy. If a tonsil is diseased it should come out and likewise some because of their size. To me a tonsillotomy appears as unreasonable as would an appendotomy. A tonsil that is so large that it interferes with free breathing, especially in the relaxation of sleep, and which obstructs normal deglutition, and on which a tonsillotomy has been done to reduce its size, has left still the bottoms of the crypts which are sealed by cicatricial contraction, confining the detritus and caseous matter which is normally thrown out. Here our second stage is sevenfold worse than the first.

As to what method of operation we select is a question to which the individual operators should decide for themselves. Some men are doing the Sluder

*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916.

operation and claim for it a universally clean operation. My hat is off to that surgeon who can do his work from a sense of touch, but if he had to put cold steel in my aural cavity I would demand that he see his manipulations before he drove his edged blade home.

That the dissection and snare operation can be done step by step and under the guidance of the eye and as quickly as any major operation should be performed seems to me sufficient reason to believe it is the operation which is destined to become most generally adopted. The tonsil operation is a serious major operation, and should be so considered.

I am not yet quite ready to defend the stand taken by a frank and honest laryngologist who admitted that he dismissed from his mind the difficulty of a differential diagnosis as to which tonsils should be removed and which left by advising the removal of all tonsils, where he could get the consent of the patient. Did you ever advise that tonsils be left in and see conditions arise afterward that made you regret your decision? I have. I have never yet regretted operating on a single case. Nor have I in interrogating my patients months or years afterward found even one that regretted my surgical efforts to add to his health and happiness. None of us can doubt what we have seen in a clinical way, that the tonsils are a principal portal of entry into the system of the cause that brings about acute rheumatic fevers, arthritis deformans and acute nephritis. No thoughtful physician can deny that the tonsils occupy an important place etiologically in our cases of endocarditis.

Such eminent authorities as Dr. Chas. H. Mayo and Dr. John Rogers claim that diseased tonsils are to blame for more than half the cases of goitre.

We simply mention their place in the production of chronic catarrhal gastritis and appendicitis. I learned just recently of a distinguished surgeon who says he makes it a rule to refuse to operate upon any case of chronic appendicitis till the tonsils have been eliminated as the possible source of the trouble. I should not omit what they do for the human race in causing headaches and offensive breath. It is stoutly argued by some with a degree of final conclusiveness that cases that have had complete tonsillectomies continue to have pharyngeal and faucial inflammations. I doubt that this percentage of cases is as large as those who have had appendectomies and yet have pain under McBerney's point. This latter class is not considered by the surgeon as he marches on in his able career relieving pain, prolonging life and affording happiness.

Osler, in his "System of Medicine," Vol. IV, page 138, in writing of endocarditis, says:

> The tonsils, the mycotic hot beds, are responsible for a good many cases, and if, as is commonly believed, the infection of acute rheumatic fever is here nurtured, they take the first rank as sources of infection.

Again, page 139:

> The so-called endocarditis from cold is probably always rheumatic and of tonsillar origin, and it may occur in febrile attacks of children as the result of a slight or even overlooked tonsillitis.

And again, page 149:

> Much could be done to lessen the number of cases of rheumatic fever, of chorea, and of endocarditis if we attacked more vigorously and more systematically the enlarged tonsils of children. Here is the point toward which our efforts should be directed. A child subject to recurring attacks of tonsillitis or marked adenoids should have the tonsils and adenoids thoroughly removed. Other measures of local treatment simply trifle with that which is always a very dangerous condition.

Here this question is answered positively, almost dogmatically, by this authority. Now, if the tonsils can be removed in childhood, youth or adult life and not be missed (and no one has ever yet proved, except theoretically, that they are missed, and it has been conclusively proved that they cause endocarditis, pericarditis, acute rheumatic fever, arthritis deformas, acute nephritis, and tonsillitis) then I can not reason myself to be wrong, nor have any conpunctions of conscience, because I have removed some few hundred pairs. I am persuaded that Dr. F. B. Stevens, who advocates a general removal of tonsils, concluding his reasoning by saying: "Better a thousand needless tonsillectomies than one death from an endocarditis, or a chronic invalid from rheumatism," is nearer on the side of right than one ultra-conservative. Their removal is at least an insurance against the possibility of contracting one or all of the aforementioned train of ills, and in this age of health and other insurance this is

after this time he came to me with an iritis of the diseased eye—afterward developing general uveitis. I made a thorough examination of his teeth and found them normal. Examination of the nasal accessory sinuses proved negative. After an expression of the tonsils I got no detritus; I considered them negative also. Al-

not a feature to be neglected. We class this as a preventive measure and we recognize the important place preventive medicine occupies in the practice today.

Editor's Note.—The two preceding papers by Drs. Cullom and Murphy complete the Tonsil Symposium. The other two papers read in this Symposium were: "Indications for the Removal of the Faucial Tonsil: A Compilation," by Dr. Albert B. Mason, Waycross, Ga., and "Experiences with the Beck-Makuen Tonsil Operation," by Dr. Clifton M. Miller, Richmond, Va., and published in the May issue. The discussion of the Symposium follows.

TONSIL SYMPOSIUM DISCUSSION

Papers of Drs. Mason, Miller, Cullom and Murphy.

Dr. E. Reid Russell, Asheville, N. C.—The results of the operation are brilliant, if it is correctly performed. A small, fairly firm tonsil whose crypts are goblet-shaped, uncovered, and open freely into the throat cavity and where there are none of the symptoms of septic absorption, may be considered not pathologic.

Sometimes we see attacks of so-called rheumatic arthritis (septic arthritis) clear up after removal of the tonsils, and sometimes chorea, rheumatic pains, retarded development, etc., disappear. Barker, of Baltimore, has pointed out that endo-, peri- and myo-cardial degeneration are traced more often to toxins from tonsils than to any other cause. In measles, scarlet fever, and diphtheria especially, are the tonsils considered the point of infection. Hoarseness and loss of voice, both acute and chronic, come from the inflammatory products in the tonsils.

The age when to operate? The pathology of the tonsils will answer this question. When we consider this unhealthy gland that has no function, in so vital a region, a natural nest for bacteria, it makes us uneasy about all tonsils.

Dr. Hugh M. Lokey, Atlanta, Ga.—To get a good discussion, I always like to hear some one say something against the paper, but everything stated this morning is so much in accordance with the sentiments of every one else, or at least my own, that the only thing I can say is this:

In the discussion of complete tonsillectomy, a person making a careful study of the etiology of his case, especially those of the idiopathic nature that we might go into, the remote origin, if he goes deeply into the case and follows it back and makes a thorough examination of the foci of infection, he can not help finding that very frequently the tonsils are the source of infection.

A few years ago I was called out to a hospital at about 11 o-clock one night to see a patient suffering with orbital cellulitis of the left eye. On going in, I could get no history other than that the patient had been suffering from an attack of tonsillitis of about two weeks' duration. Following the tonsillitis, she had had boils in the head and was carried to the hospital with orbital cellulitis. The patient was a very healthy-looking young woman of about twenty-two or three years of age, but as her husband had had Neisser's infection some time previously, it was suspected that there might be some infection existing in the eye through local infection, and I asked to have a smear made from the secretion from the eye to see if it really were infected or rather to see the nature of the infection. On calling the next morning the report showed strepto-staphylococcic infection. The cellulitis had increased in the left eye and was also present in the right eye. I might state that the treatment given the night previous consisted of ice packs to the eye continually. The nurse in attendance told me that the patient had been having sinking spells at intervals during the night. The patient described these spells as of having a feeling of fainting away. While I was at the bedside the patient told me she felt one of those spells coming on, so I stepped over to her, took hold of her pulse and found that the beat was getting rather rapid and beginning to get rather weak. It became weaker and she began to get pale. The pulse became very weak and wavering, and as she began to revive I bent over her and listened to her heart. With my ear I could hear the heart distinctly churning away in an effusion of the pericardial fluid. I immediately ordered ice packs over the heart and the patient to be kept perfectly quiet. As soon as I could get in touch with the physician in charge, who had called me in consultation, I advised him that our patient was a very sick woman and that he had better see her as early as possible. He called me a short time afterward and asked if I had any objection to having some one else in consultation and I advised him that I had none whatever, as the more we had the better it would be in her condition. We agreed to hold a consultation at 1 o'clock, but at 11 o-clock I received a message from the hospital that the patient was dead. This was clearly a case of toxic or septic infection, due to the tonsils, which had troubled her two weeks previously.

Only last week I operated upon a case that two weeks previously had developed an acute iritis, and, in connection with it, an acute attack of arthritis. I had advised during the past summer that the tonsils be removed, as the patient was subject to acute attacks of tonsillitis. Upon expression of his tonsils I got a large amount of detritus from the crypts. After several expressions the patient began to improve, so I insisted upon an early removal of the tonsils. As soon as he was in condition for the operation I did a complete tonsillectomy. During the operation as I grasped the right tonsil I ruptured a large abscess filled with creamy-yellow pus. The deep crypts of both tonsils were filled with concretions of cheesy substance. In less than twenty-four hours after the operation the patient began to improve of his iritis and has continued to do so, and he is now able to resume work.

Last year I had a patient whom I had first seen about ten years ago, when I was in the office of Dr. A. W. Calhoun. At that time he had what we diagnosed as chronic choroiditis. On the occasion of his call to my office he came for refraction, which I made. About one month though the Wassermann showed negative, after having been seen in consultation it was decided that he be put on alterative treatment, with the idea that he had a latent syphilitic condition. After several months of this treatment, with ups and downs in his condition, we got very poor results, and, as he was going to New York on a business trip last spring, I advised him to see Dr. Weeks. Dr. Weeks could find no cause other than possibly the tonsils and had a smear made from them—a bacteriological examination of a culture—and found a mixed strepto-staphylococcic infection. He had him continue on the alterative treatment, but had the tonsils removed, and rapid improvement was the result. Though Dr. Weeks suspected a tuberculous infection might be responsible to some extent for this condition, the patient continued to improve under this treatment, and the last time I saw him he was practically well so far as any acute inflammatory condition was concerned.

Dr. E. L. Roberts, Nashville, Tenn.—I want to speak especially in regard to the technique of the operation, and I consider that described by Dr. Cullom as almost perfect. The fact he emphasizes I want to stress, and that is that if you want to do the operation right you must see where you are operating; and in order to see where you are operating you must have the field of operation exposed, and you must have a good light on that field. Dr. Cullom has shown you a number of very valuable instruments of his own devising. He says his mouth gag is the only one that has the tongue depressor attached at the side instead of in the median line. In this statement he is correct, and I think he could go further and say it is the only one that ever will be so constructed. If the gag which I designed and have already tried out on something like five hundred cases had been on the market sooner, I feel sure that he could have saved much time and labor that he says he spent on his. I should be glad to show mine if the Chair's rulings did not prevent it. It has a central tongue depressor without any of the defects that Dr. Cullom says go with such instruments.

As to the new methods of controlling hemorrhage (lest the Chair call me down for getting off the point), Dr. Greene made a valuable point, I think. I have followed that procedure a long time and with very great success. I did not know, however, that the tonsil was of any value as a hemostat itself, except as a mechanical means of making pressure, but have used it time and again; in fact, have used it regularly. I hold it back in the fossa sometimes for perhaps a minute, and I find that bleeding is very greatly checked. I had no idea any principle was involved except the purley mechanical one of pressure, using the tonsil as I would use a sponge. As soon as the tonsil is removed I have my assistant place in the fossa a large sponge which he has ready. If this one is not sufficient, as shown by the blood coming around it, others may be added. He keeps the sponges in for perhaps a minute, maybe two minutes, and then removes them for inspection.

Dr. Cullom says he uses two sponges, removing one to see if he can tell where the blood is coming from. I employ a method which I got from my co-laborer, Dr. John Moore, with whom I have worked a great deal in my clinics. Instead of using two sponges and then removing one of them, I make firm pressure in the fossa with one sponge and gradually move it upward, downward, forward, or backward, and thus expose one bleeding point at a time till I am able to locate every point that blood is coming from. However, if gentle but firm pressure is made as above indicated, this last step will not often be necessary.

Dr. J. M. Baird, Columbus, Ga.—In my hand I have found it necessary only in a few instances to use the hemostat. In the Homeland Hospital they use ice water. I invariably use ice water and ice towels; in many instances, a piece of ice as large as my hand and rubbed carefully on the throat. I have never had a hemorrhage that was not stopped after a few moments, and in only two did they gush out as described by Dr. Cullom.

I would like to state that if the Beck method is used there will be no trouble with hemorrhage.

Dr. C. L. Kibler, Columbia, S. C.—In the past year I have done two or three hundred tonsillectomies, and in a few cases in which I have employed Dr. Cullom's technique I have had an enormous amount of hemorrhage. I, too, had a clear field of vision, and really I saw too much. I saw where I was severing blood vessels, and I would have to put anywhere from two to five ligatures to control hemorrhage. As a rule I seldom have use for ligatures, as I made some slight pressure and never use the clamp to control hemorrhage. I hate to see any real surgeon use a clamp. If you have hemorrhage to alarm you, tie it. The operation complete must be a clean one, with as little bleeding, as little trauma and as little shock as possible. If you can do a tonsillectomy in a few minutes and have no trauma nor scar tissue to follow, as do result in many tonsillectomies by dissection, as I have known from my own experience, then why not use that method, namely, the Beck-Makuen method, which I consider the best and last word on tonsillectomy? First, it is very quickly and completely done; secondly, you have no hemorrhage; thirdly, you have no trauma, and have quick convalescence, and in three or four days your patient is back at work. You can perform the operation on a child one year old or on a person seventy-five years old. If it is a complicated case, following an old peritonsillar abscess, where the capsule is adherent to muscle, due to scar tissue, I prefer a plain dissection. You then have to remove some of the muscle with the capsule or leave some of both. I will say that in my experience and observation that the Beck operation is the one of choice. I would like to say here that all those who use this method are very enthusiastic over it, and it will, I am quite sure, be a revelation to those who have never seen it when once they have had an oppor-

tunity to see it performed. Again, it is so entirely satisfactory, so quickly performed with no trauma, shock or hemorrhage, and involves such a short convalescence, that it is almost a shame to make a fee and take it from the patient.

Dr. E. C. Ellett, Memphis, Tenn.—Let us not omit giving credit for the tonsil suture needle mentioned by Dr. Miller where it belongs—to our former officer and fellow member—Dr. Homer DuPuy, of New Orleans.

I wish my friend from New Orleans, Dr. Dimitry, were here so that he could hear something about the unsurgical way in which some of this tonsillar work is done—trying to stop hemorrhage with horse serum and tannic acid instead of catching and tying the bleeding points.

Some claim that the trouble known as chronic catarrhal otitis media can be cured by removing the tonsils. In many cases it is really otosclerosis and never was helped by anything anybody ever did—removing the tonsils or anything else.

I am sorry the ruling of the Chairman prevents my saying something in regard to the *only* tonsil operation, namely, the Sluder.

Dr. George B. Smith, Rome, Ga.—The last has not been said upon this subject, and when it is the millennium will have been reached. We all do tonsil operations, do them differently, and it is to be hoped get equally as good end results. If the Chairman will permit me, Dr. Cullom mentioned the subject of anesthesia in his paper, and I would like to refer to nitrous oxid. I use it exclusively in this work and would like to commend it to the Section. You need an experienced anesthetist and a good instrument. I prefer the Hydbrink, but use others successfully. The patient having been put upon the table, a mouth gag is introduced, but not opened. Both the nose- and mouthpiece of the instrument are used to begin with. When the patient is anesthetized, the mouthpiece is removed, allowing the patient to get the nitrous oxid-oxygen through the nosepiece; the gag is opened and the operation is begun. Anesthesia is continuous and very satisfactory.

Dr. Eugene Callaway, Selma, Ala.—In regard to the advantageous results of the tonsil operation, I would like to report a case of cure by the tonsil operation which, to my mind, is the most interesting of which I have ever heard. I take no credit for the cure, because I removed the tonsils solely as a tonic measure for the purpose of benefiting the general health.

The case was referred to me by a general practitioner, who asked me to go into the history and to help him in any way I could.

The patient was a girl of about nineteen years of age, but apparently about fourteen, whose mother gave the following history: Since some three years of age the child had suffered from vaginal pruritis, itching around the clitoris and painful micturition, evidenced by tightly pressing the hand over the vulva during the act of voiding. General health had been good except for "nervousness."

We excluded the masturbation idea by the fact that she never secluded herself during the attacks, but constantly sought the company of her mother.

She had been treated by a number of good specialists. Had had traumatic adhesions of the clitoris broken up twice. Her eyes had been refracted for hypermetropic astigmatism and in addition had had two of the extra-ocular muscles clipped—all on the theory that her trouble was due to "nervousness."

As a tonic measure the removal of very large tonsils filled with caseous matter was advised. Urine showed a few pus cells. Tonsils removed and patient kept in bed for four days. No treatment. Urine normal and patient was cured of all symptoms.

Diagnosis, cryptogenic infection of bladder, which proved to be a focal infection from the tonsils.

Dr. Joseph B. Greene, Asheville, N. C.—In taking part in the discussion of this Symposium I wish to address my remarks particularly to Dr. Cullom's paper on "The Technique of Tonsil Excision." I wish to endorse what he has said in reference to hemorrhage and to say also that I regard this as the most important factor against which we have to contend in tonsil removal. In this connection I wish to speak of a procedure which, in my hands, has greatly lessened bleeding during the operation. The idea was gotten from brain surgeons who use muscle tissue plastered over the bleeding area to control difficult tonsillar tissue contains fibrin elements which bleeding from brain tissue. In the same way contribute greatly to the clotting of blood during the time of the tonsil dissection. The idea is, during each step of the tonsil dissection to press the tonsil back in its fossa and thus control the bleeding really before it takes place. By doing this the operation proceeds in a fairly bloodless field, and the field of view should not be obscured by a pool of blood. There is another advantage of this procedure and that is that the trauma is lessened by gently forcing the tonsil into its fossa with a gauze sponge instead of resorting to the use of sponges directly into the tonsillar fossa after the gland has been removed. A fuller account of this procedure is given in the October number of *The Laryngoscope.*

Dr. W. Likely Simpson, Memphis, Tenn.—One of the usual indications for the removal of tonsils is cases in which peritonsillar abscesses occur. It means the removal of tonsils after an attack, after the pretonsillar abscess has subsided. I have found in the last year or so that by removing the tonsils in these cases with beginning peritonsillar abscess that they get along very nicely and prevent, or totally eradicate, pretonsillar abscesses at that time, and I do not have any further trouble.

Dr. Albert B. Mason (closing).—I think that if Dr. Cary, instead of having chosen the subject he did for his paper yesterday, had taken the subject of tonsil work he would have gotten all he was looking for in the way of discussion.

In one of my replies—the gentleman's name I forget, though I do remember his being a Kentuckian and claiming to have done the first snare operation—the doctor has been doing the operation 25 years, and has never had any bad results or death from hemorrhage, and injury to the voice; nothing but good results from his op-

erations. He started over 25 years ago and there is no telling how many thousands of cases he has operated upon.

One doctor mentioned the removal of tonsils in peritonsillar abscess. We laryngologists have been taught—and no doubt practice it—to leave the tonsil alone in acute attacks, operating after the attacks, whether there be acute tonsillitis or acute peritonsillar abscess. In this connection, however, I would report that Higginbothan has reported 500 cases operated upon for the cure of acute attacks, and that in none of these were there any complications. A month or so ago I was compelled to remove a pair of tonsils during an acute attack to keep the child from choking to death. I tried to get her over the attack, but twice in five or six hours she became cyanotic and her physician and I decided that the sooner her tonsils were out the better. We operated upon her and she made an uneventful recovery. We had operated upon her brother during the same morning with an acute attack of tonsillitis with acute rheumatism. He was carried into the hospital unable to walk. The day after the operation, twenty-four hours later, he was able to walk enough to get in a cab and leave the hospital.

In regard to hemorrhage I can not understand why so many operators get the hemorrhage they claim to get. Personally, I have never had to ligate, never had to pick up, never had to twist a bleeding vessel. It is true I have not done many,—many of you gentlemen have done thousands,—but in all my work I have had only one bleeder, which I controlled, after using pressure, tannic and gallic acids and emetin with coagulose.

I believe, as Dr. Cullom stated, we should prevent hemorrhage. All my cases have a dose of calcium lactate four times a day for four days preceding the operation, and an ampule of emetin while on the table. Since I have been using this double shot, calcium lactate and emetin, the hemorrhage has been very slight.

Dr. Clifton M. Miller (*closing*).—The criticism of the use of the fingers, of which the doctor spoke, in the Beck-Makuen operation is not justified because you have your fingers and your eye, too. You see what you are doing and you feel what you are doing, and if you know your technique you do it well.

Speaking of indications, I have had what, to me, was the most remarkable case I know of. A little girl of good surroundings had repeated attacks of acidosis, so-called, and in those attacks she would always limp. That child had been gone over by the best internists in the city of Richmond; X-rayed from her head to her heels; had been refracted; I had examined her throat repeatedly; her tonsils were normal in size for her age; there were absolutely no adhesions; she had never had sore throat; and there were no adenoids in the vault of the pharynx. She was a biddable little thing and I could use the mirror on her perfectly easily. With no abscess revealed by the -ray, there was, about half an inch externally to the right transverse process of the second lumbar vertebra, a small opaque area entirely within the muscles. We did not make an X-ray picture to exactly localize it, that is to say, it was simply an anteroposterior picture. The naso pharynx and her tonsils, particularly the pharynx, were in perfect condition so far as I could see. The mother was a highly intelligent woman. She could have everything necessary, but I had gone so far as to look to see if there were any adenoids, at home, going there when that child was asleep to see her breathing. The child absolutely slept with her mouth clamped tightly. I reached for the adenoids and found none. I expressed the tonsils and drew them away forward to do it, and in the posterior aspect of the left tonsil I squeezed out some pus. I said: "She is going to the hospital." I did not ask any questions. I said: "She has to go." And the mother said: "All right; anything you say." I took the tonsils out in April or May. She has improved decidedly. She has had but one of those attacks, six weeks afterward, and that was doubtless from prior poisoning. She is absolutely well, so far as that is concerned. Tonsils that seem normal on superficial examination may contain a focus of infection.

Dr. M. M. Cullom (*closing*).—I have found long ago that you can't give a tonsil a clean bill of health by inspecting it, nor by making pressure in the effort to expel pus from the crypts. Of course that is the procedure to follow and you can catch many innocent-looking tonsils in that way and prove them diseased. When you have constitutional symptoms and can not locate the focus of infection anywhere else, the proper thing to do is to remove the tonsils, even though it appears absolutely innocent. If you have not been in the habit of doing this, you will be shocked to find how often there is a concealed pocket of pus in the harmless looking tonsil. In many cases the appearance of the tonsil gives absolutely no indications of the mischief it is doing.

Dr. Lokey's remarks were very interesting. In the last five years I have examined cases of iritis with great interest. When I have a case of iritis that is not frankly specific I look for trouble in the tonsil or some other focus. If I find infected tonsils in connection with iritis I remove the tonsils in the height of the attack of iritis. If you have never removed infected tonsils in the presence of acute iritis you have a surprise in store for you. The effect is little short of marvelous. Usually the eye is almost white by the next day, and the pain disappears like magic. Without having scientific evidence to base it upon, I am inclined to believe that many cases of iritis in specific subjects are bacterial in origin instead of being due to the spirochete, and the reason they improve under specific treatment is on account of the germicidal effect of mercury.

Dr. Greene's suggestion of forcing the tonsil back into the fossa to control hemorrhage is new. It looks rational and is worth trying.

The question of operation in the case of singers has been much discussed. I have operated upon a number of professional vocalists. The results have been uniformly good. In practically every case the voice was improved. One is a singer of reputation who sings for the Victor people. After the removal of her tonsils her

range was increased by several notes and her voice gained in sweetness and purity. I have never seen a patient whose voice was injured by a properly performed tonsillectomy. Indeed, I have seen only one who claimed any injury to the voice, and in her case the pillars were badly mutilated and contracted and part of the tonsils had been left in.

I should like to be able to do the Hudson-Makuen operation, but I am frank to say that it looks to me to be pretty diffiicult to take out the tonsil and leave the capsule behind. To my mind the difficult thing in a tonsil operation is to keep back of the capsule. Unless you have a sharp-pointed knife with which to slit the mucous membrane and get back of the capsule, you are liable to get in front of it and leave a little tag of tonsil tissue, and when you come to look at it later you find a mass as big as your thumb that has hypertrophied from the little particle of tissue left behind. This is apt to occur in the supra-tonsillar fossa and at the base. I am a believer in safety first.

We should remember that patients consult us not on account of having a singing voice, but on account of having ill health, and that is the reason we advise them to have their tonsils out. Good health is more important than the tone of the voice, and in the question of removing a source of infection the voice should receive a secondary consideration.

AUTHORS' ABSTRACTS

Eye, Ear, Nose and Throat

The Conservative Treatment of Diseases of the Nasal Sinuses. Eugene L. Vansant, Philadelphia, Pa. New York Medical Journal, Vol. CV., No. 12, March 24, 1917, p. 547.

Although a prompt and thorough radical operation would be the most conservative treatment possible in certain severe conditions of the sinuses, still in the average case there are measures that frequently give entire satisfaction without surgical interference.

A thorough, careful examination and an accurate diagnosis are of the greatest importance.

A sinusitis caused by the root of a decayed tooth or a molar abscess, or by syphilis, the exanthemata, influenza or mineral poisonings should be treated by the removal of the offending cause rather than operation.

A conservative treatment must be based upon well-established medical and surgical principles:

1. Drainage and ventilation must be established;
2. Pus must be evacuated; and
3. The underlying causes must be removed.

Drainage and ventilation are frequently interfered with by intranasal causes. Many of these are described and their appropriate treatment given. Retained pus must be evacuated; various methods to do this are described. Many underlying causes and general conditions are mentioned and their proper treatment recommended. The use of vaccines is discussed.

Conclusions.—If drainage is established from the sinus into the nasal chambers, if the evacuationof pus be aided, and if the underlying general and local conditions be properly treated, a considerable percentage of nasal sinus suppuration may be successfully relieved without surgical operations upon the sinuses.

AUTHORS' ABSTRACTS

Surgery, Gynecology, Obstetrics and Genito-Urinary Disease

(Contiued from page 510)

the standpoint of time and a successful nerve suture, is seen in the protopathic system. Here, when the tests are carefully made, pain points of various intensity and number can be demonstrated in the midst of an area otherwise completely analgesic. That these pain points are evidences of a regenerative process in the nerve was demonstrated not only clinically, but was also completely corroborated in one case where it was fortunate enough to secure a histological examination after a secondary nerve suture.

The decrease in the threshold sensibility of these pain points seems to run parallel with the time and success of the nerve suture. By this is meant that during the period of early regeneration the pain points are very hypersensitive, probably a type of protective mechanism in order to guard the end organs of the skin from external injury during their most delicate period. As the process of regeneration proceeds, these pain points become less and less sensitive, finally disappearing altogether when regeneration is complete.

It seems, also, from our clinical and neuropathological studies, that the true source of regenerative processes in the nerve trunks is to be found in the neurilemma cells of the nerve trunk itself. It is in the presence of the neurilemma cells, or rather on their very active proliferation, that the possibility of regeneration and recovery after injury or suture is based. Such a theory of the mechanism of nerve regeneration has an important bearing upon the conception of the histogenetic structure of the nervous system and also upon the more practical aspects of the evidence of regeneration after primary or secondary suture.

Osteochondritis Deformans Juvenilis. Edward Jelks, Jacksonville, Fla. The Journal of the Florida Medical Association, Vol. III, No. 9, March, 1917, p. 257.

The writer reports a typical case of osteochondritic deformans juvenilis in an attempt to show the important relation of this disease and tuberculosis of the hip. It was not until 1910 that these two conditions were differentiated absolutely. Their symptoms are almost exactly similar in the early stages, just at the time when a clear diagnosis is of most importance to the patient. Later the absence of constitutional disturbances directs one away from tuberculosis. Tuberculin tests are helpful.

The most important diagnostic information is obtained from the X-ray examination. The picture is absolutely different from that of tuberculosis. There is atrophy with flattening of the epiphysis into a cap-like or mushroom shape; and hypertrophic thickening of the neck of the femur with the appearance of coxa vara. The

(Continued on page 529)

SPECIAL ARTICLE

SECONDARY AND COLLEGE EDUCATION IN THE SOUTH IN RELATION TO MEDICAL EDUCATION*

By J. H. Kirkland,
Chancellor, Vanderbilt University,
Nashville, Tenn.

In discussing the question of education preliminary to the study of medicine, I have no reference to an ideal plan, but desire to present some of the problems which medical colleges in the South have had to meet in the past ten years. The tremendous advance in medical education has been along three lines,—first, the character of teaching in medical colleges; second, the great reduction in the number of such colleges; third, the reduction in the number of medical students. This last reduction has been brought about chiefly by the increase in requirements for admission to medical colleges.

The influences that have brought about these changes are well known. They are particularly the American Medical Association and the Medical Council of the same, the Association of Medical Colleges, and the Carnegie Foundation through its reports. The means employed by these various associations have been without sanction of law, but have had all the efficacy of legislation. Publicity exercises a pressure almost as great as legal enactment.

In regard to preliminary education we may distinguish three periods. The first period extends to the year 1914. In that period the completion of a high school course was required for the study of medicine. The second period extends from 1914 to 1918. We are now in that period. The present requirement is the completion not only of a high school course, but of one college year devoted to sciences and a modern language. The third period will begin in 1918, but has already been advertised so that we know its demands. In this period preliminary education of medical students must be two college years.

Without attempting an exhaustive discussion, I desire to say in passing that high schools in the South had not been brought up to the required standard of work by 1914. They had shown great improvement in quality of work and in numbers. Many influences have been brought to bear upon this problem. It was not alone the demands of medical colleges that caused the great revival of high schools in the South in those years. So far as the South is concerned, the requirements of a satisfactory high school course were not being properly met in the year 1914 when the medical authorities decided to take another forward step and require one college year. Some of us felt uncertain as to the wisdom of the step then taken, but the Medical Council had been desirous of introducing a college year as a requirement even as early as 1910. It was, therefore, impossible to postpone it longer than 1914.

The requirement of one college year, which has been in effect for three years and will continue one year longer, has not been entirely satisfactory. Most students are compelled to begin the three important sciences of chemistry, physics and biology at the same time. In each of these they have laboratory work. This has not commended itself to the best judgment of college faculties. Furthermore, the college curriculum does not usually provide courses for such students and the number of premedical students has been so small that colleges have not been willing to disarrange their work in order to accommodate them. For these and other reasons there has been a constant agitation for a change in premedical requirements from one college year to two. This has now been accomplished and will go into effect in 1918. From the educational standpoint it will surely be more satisfactory.

A practical difficulty that has embarrassed medical colleges in the past three years has been the enforcement of requirements now in existence. The enforcement of the existing rules and regulations has been in the hands of the Medical Council, represented by its Secretary, and the Association of Medical Colleges. Detailed rules have been promulgated, some of which are highly technical and arbitrary. A schedule of high school work has been printed and widely circulated by the Medical Council, dividing this work into required and elective studies. Most colleges have assumed that this was an absolutely fixed requirement. At the same time it

*Read in Conference on Medical Education, Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916.

varies greatly from the requirements at present in force for admission to the freshman class. It is doubtful if a single college of high standing in the United States enforces or recommends the exact outline of work suggested by the Medical Council. There is, therefore, a divergence between requirements recommended by the Council and requirements for admission to the regular freshman class. This is confusing and works a hardship on the student whenever effort is made to hold to the schedule of the Medical Council. Again, the enactments of the Council regarding conditions are highly technical and arbitrary. These enactments resulted a few weeks ago in the exclusion from the freshman class of the Vanderbilt School of Medicine of a student who had graduated from Millsaps College, Miss. We regarded this student as entirely capable of carrying the course of study as given in our institution. He could have been admitted in September, 1915, but could not be admitted in September, 1916.

Looking to the future, the difficulty in the new requirements soon to be introduced is not an educational one. The real problem will be in the realm of finance. The new requirements will keep the attendance down at the lowest possible point for six or eight years to come. The practical question is whether medical schools can be kept alive during this period. No medical college can now live on its fees. The institution that has an average attendance of 100 students during the next ten years will be fortunate. These students will bring in $15,000 in income. No medical course can be conducted for them without an expenditure of $50,000 in addition to fees. Even this amount assumes that much of the clinical work will be provided from sources outside the medical college, as from city hospitals or private institutions of charity. Statistics already collected show that out of 95 medical colleges now in the United States only 36 expend $50,000 or more annually. What is to become of the remaining 59? Only 13 of all the 95 colleges had aid two years ago from city or state amounting to $25,000. Clearly, then, we may not look to public appropriations to supply the needs of medical education. It is equally clear that we can not supply these needs from student fees.

My closing thought, therefore, is this. The associations that have been so largely responsible for the rapid increase in medical requirements must assume a further responsibility, a responsibility for the support of medical schools. The authorities of these associations must make themselves helpful in securing large endowment or large appropriation from city and state. Without this further assistance the work will be but half done. The influence of the medical profession should not be to kill, but to make alive. At present much has been done to kill medical colleges. Care must be taken that this does not become a universal habit. The task now before the medical profession is a constructive one, to build up, to support, to encourage the medical colleges that are really needed and are honestly trying to serve the public.

DISCUSSION

Dr. Robert Wilson, Jr., Charleston, S. C.—I suppose there is no more important subject with which we medical men who are concerned with teaching have had to deal in the last few years than that of preliminary education. Personally I am in accord with the requirement of two college years. When we took on the one college year requirement we very soon found out that educators were unable to supply us with students adequately prepared according to our standards, and as Dr. Kirkland has stated, the leading educators were unwilling to modify their various courses in such a way as to meet our demands. Several of them told me that they would be perfectly willing to do it, but were unable. We found, therefore, that when we admitted a student who had been only one year in college it was almost invariably with conditions; I might say invariably. The school with which I am connected felt that it was a hardship to require these men to enter with conditions and impose upon them at the beginning of their medical career such a handicap. We, therefore, put on at once a two-year requirement, feeling convinced that in order to get students who were prepared in accordance with our requirements one year of college work is absolutely insufficient. There is no other way out of it.

It seems to me that in concentrating our attention so much upon the standardization of our courses and curricula, we have almost come to look upon standardization as an end and not as a means. The object of our requirements is to obtain men properly prepared for the study of medicine. A too rigid insistance upon certain requirements will have the effect of turning away from our doors, very often, men who are thoroughly qualified to take up the study of medicine, frequently better than many of those whom we admit. I think that our requirements, as Dr. Kirkland has stated, are entirely too rigid in many particulars. The preparatory studies might

be grouped into those which are purely cultural and those which have a utilitarian value, and then there are certain utilitarian subjects which have also a greater or less cultural value. Algebra has no important application to the study of medicine, for instance, but it has a decided value as a culture study. The study of Greek likewise has but little practical value. Such studies, on the other hand, as physics and chemistry are essentially utilitarian. Those subjects also have a cultural value as well. Two or three years ago, to illustrate the effect of too rigid requirements, we had a young man, a college graduate, apply for admission. He had had four years of Latin and two or three years of Greek, but his course had been so arranged that he had had no modern language. According to the requirements to which we were obliged to adhere, he was not eligible for admission because of the lack of a modern language. Now, a year of French or German can not be of any practical value, and certainly has no cultural value, while the study of Greek has a decided disciplinary value and yet with this admirable mental equipment he was not eligible if measured by rules.

I could cite a number of such cases. It seems to me, therefore, that one of our first aims should be to obtain a series of subjects which admit of greater elasticity. Of course we have to require certain things. A man has to have a certain amount of chemistry and physics, and he should also have a certain amount of mathematics; but the list of required studies could be modified so that a greater range of choice might be afforded the student and greater latitude allowed the college in exchanging values. I think that our requirements ought to be so arranged as to admit of a much greater degree of elasticity than they have at present.

Dr. W. F. R. Phillips, Charleston, S. C.—Probably the most important thing we have to deal with today in medical education is embodied in the subject Chancellor Kirkland has brought before us. It is a fact that we who are unacquainted with general educational matters, or, while in a way acquainted with them, have been so long away from the field of general education, have taken it upon ourselves to prescribe a course of preliminary education for our medical students. It seems to me that in so doing we have been not a little bit in the position in which we would regard the layman to be if he prescribed in what medical education should consist. It is only by getting the general educator to come to us and instruct us in what general education consists, what general education can do, what really general education is, that we can appreciate what should be done,—what we should prescribe for our students.

For myself, I have been for many years impressed with the fact that we look too much at the paper record of performances and too little at the student himself; that we look too much at what he has been said to have accomplished and too little at what we can tell that the student can accomplish when we look him over individually. A medical student who comes to us knowing his own mind may not have all the preliminary education we ask, yet he may be mature in years; he knows thoroughly what he wants; he is willing to work, and we see and find him to be an intelligent man. Why should we reject such a man—refuse to admit him simply because he has not completed a high school course or taken a prescribed college course in a prescribed college? I think we should devise some way of reaching the individual, testing the individual himself. I accept the fact that, if we permit the medical school to pass on the individual, there is an incentive often to look at him in a more favorable light than he deserves. Chancellor Kirkland has intimated it. We are facing a very serious condition in medical education,—a financial condition, the means of running a medical school. We know that students' tuition fees count for something, a great deal in some instances, and we should remember the invocation we occasionally make of "Lead us not into temptation," and should not tempt ourselves to pass students into the medical school simply because we need them to help out the running expenses. But we should get together in some way and see if there be not some proper means, some feasible means, by which the proper student may be admitted who may chance to be without the paper credentials prescribed. By proper student I mean the student who possesses the natural inclination to study, to work; who has native intelligence, industry, and perseverance, but who may lack the paper prerequisites of preliminary preparation.

Dr. Gordon Wilson, Baltimore, Md.—We have a right to turn to the general educator and ask him why it is that in this country as compared with Germany, France and England, a boy in the same grade is two years older than the French, German or English boy. This fact was brought out some years ago in more than one publication, and my own attention was attracted to it through an article published in the alumni monthly of Yale University. The age at which a man becomes self-supporting is most important, and if two years are lost the result is imperfect medical teaching or a gross economic fault which is bound to eventually lead to evil results.

Dr. Lucius E. Burch, Nashville, Tenn.—The mistake that the medical profession has made in the past has been in refusing to accept suggestions from the laity. We have looked upon medicine and medical education as Holy ground. This should not be the case. The public are naturally interested in medical education. They are first interested from the standpoint of premedical education, which subject really belongs to the university and not to the medical college. They are naturally interested in the progress of medicine, because they are the ones that are benefited by it, and of course they want instruction from the medical man in hygiene, sanitation, prevention, etc. We must remember that in the last fifteen years medicine has been remade and great strides in medical education have taken place. The changes have been so fast and so rapid that many mistakes naturally have occurred, but at the same time much good has been accomplished. If you will look back to 1906, you will see that there were one hundred and fifty-eight medical colleges in this country. At the present time there are only ninety. This reduction is due to the publication of statistics by the Council on Medical Education of the A. M. A. annually, showing the standing of the various medical schools.

Much good was brought about by the report of the Rockefeller Institute. This report is really what caused the sudden revolution in medical education. Dr. Pritchett remarked at that time: "There are faults in many medical schools, but I think you will only find scandals in the medical schools of America." A great change for the good has taken place, and but very few bad schools exist in this country.

The standards that have been formulated for the medical schools in the past have been entirely too rigid. There has been no elasticity. Much good can be accomplished by a conference like the present one. We need the opinions and views from the heads and presidents of the various universities, and I wish others would follow the lead of Chancellor Kirkland and attend these conferences.

From the standpoint of medical education, I would like to make this suggestion. It is one, however, that I have not had an opportunity to talk over with Chancellor Kirkland, and I do not know what his views are in this regard. I think bacteriology should be placed in the premedical course. It is purely a scientific subject, and one that can be handled as well by the university as by the medical school. Organic chemistry, of course, will go to the premedical course on the adoption of the two-year premedical requirement. The first year and a half of medical education should be given up to the laboratory subjects. The latter half of the second year should embrace physical diagnosis, minor surgery, bandaging and a short course in medicine. In the junior year the various practical branches are taken up, and the senior year should be almost clinical, the student spending the greater part of his time in the hospital, dispensary and at the beside. If the senior year is a clinical one, this will eliminate, to a certain extent, two years of hospital work. The great problem that we have is to get the medical man started in life at an earlier date than he is at the present time. A very late start in life in one's profession is a handicap for the reason that the initiative is gone, and this, to a great extent, is the key to success.

Chancellor Kirkland (closing).—I have only one word to say and that is with regard to the possible shortening of elementary school work. Undoubtedly American schools have not been so efficient as the schools of Europe, but it is not fair to say that nothing has been accomplished. Much has been done in many quarters. This matter has been approached from the standpoint of the schools themselves, from the standpoint of colleges and from the standpoint of medical schools. In this country we labor under a great disadvantage in attacking any question of this kind. We have no National board of education. The Commissioner of Education can give advice, but he can not issue orders.

AUTHORS' ABSTRACTS

Surgery, Gynecology, Obstetrics and Genito-Urinary Disease

(Continued from page 525)

epiphysis may be divided into different pieces; the epihyseal line is irregular and broader than normal.

The etiology is yet not determined. Probably the condition is some form of infectious arthritis, not tuberculosis. The treatment consists in clearing up possible foci of infection and the protection of the joint against injurious motion. Treatment is somewhat similar to that for tuberculosis, but need not be nearly so strenuous. The ultimate result is almost always good. After nine months of treatment the author's patient shows marked improvement.

Thrombotic Hemorrhoids. Max Henning, Memphis, Tenn. Memphis Medical Monthly, Vol. XXXVIII., No. 1, January 1, 1917, p. 1.

A very old interesting malady, dating back before Joseph was sold into bondage, and mentioned several times in the Bible, as in I Sam. 5:9, "And he smote the men of the city, both small and great, and they had emorods in their secret parts."

Hemorrhoids and piles are synonymous, the term "piles" being best for general use, as people know its meaning.

They are classed as external and internal. Then the external into the varicose, thrombotic and connective tissue piles. Thrombotic is usually meant when the patient says he has an attack of piles, meaning a small bluish sensitive tumor just outside the anus.

Opinion varies as to whether or not it is a ruptured vessel and clot, or a thrombosis. Personally, I prefer the rupture theory.

Prognosis is good if proper treatment is carried out. Three things may happen if there is no operation: the clot is absorbed; it becomes organized and encysted; or there is infection, abscess, then a fistula.

Treatment: Surgical, enucleate clot. Antisepticize, cocainize, incise through tumor tranaverse to anal margin, remove clot with forceps unless it comes out; squeezing causes bruising and delays healing. Compress and T-bandage, and advise patient to see you next day. If clot is reformed, remove it; pack wound with gauze and redress. Remove gauze next day; keep patient quiet a few days.

Excision method, removing entire pile, is advisable if the thrombus is in old tab skin. Anesthetic is injected into the base and under the tumor. Lift pile with forceps and remove the clot with curved scissors. If there are any bleeders, ligate them. May leave it to heal by granulation or may close the wound with suture.

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EDITORIAL DEPARTMENT

DUTY CALLS—LET US NOT FALTER

In April of last year the Presidents of the American Medical Association, the American Surgical Association, the American Congress of Physicians and Surgeons, and the American College of Surgeons displayed marvelous forethought and insight into the future.

Foreseeing just the situation which today confronts the medical profession of this country, they at once set to work to devise means for organizing and for placing at the disposal of the National Government the vast resources of our profession.

At once sprang into being the Committee of American Physicians for Medical Preparedness, the arms of which were to extend into every state in the Union, these arms to be known as the State Committee for Medical Preparedness, each and every one of which should work in harmony with, and under the direction of, the Council of National Defense.

Further than this, each state committee, through the organized machinery of the State Medical Association, was destined to penetrate into each county of the state and thereby reach the individual doctor—the man whose services our country now needs.

Such is the machinery; each state has on its committee nine repesentative men, leaders of thought and scientific work within the state. The time has now come for those men to continue to lead; that is, they should at once, if they have not already done so, join the Medical Reserve Corps; so that they can, by precept and example, the better accomplish the important work assigned to them.

It is estimated that, properly to officer with medical men the armies as now contemplated by Congress, there will be needed from each county medical society about one man in seven; that is, a county medical society with, say, a membership of 35, should furnish at least five men for the Reserve Corps; one with a membership of 70 should furnish 10 men, and so on.

It can be seen, therefore, that our duty in this matter is plain. The medical profession has undertaken to co-ordinate, to assist and at the proper time to deliver to our National Government the requisite number of physicians to officer her armies. Our country now calls; the medical profession, ever in the foreground when duty and humanity are to be served, will not now falter.

LISTEN TO THE VOICES FROM FRANCE AND ANSWER

To the Medical Profession of the South:

Congress has listened and answered with the Army bill. The President has answered with his signature and orders for the first division of regular troops for France.

Dr. Charles A. Powers, a former President of the American Surgical Association now in France with American ambulance, sends this message:

I hope that you will permit me to add one general word and that is this: Those of us who are here realize that it is in no way possible for our people in America to understand the importance of the present situation. We are at open war with a strong, determined, implacable foe, and it should be the first order of business for every man, woman and child in the United

States to endeavor to help in crushing this monster.

The medical profession of this country should listen to this message from France and answer by immediate enlistment in the Officers' Medical Reserve Corps of the United States Army or Navy. We shall need in a few weeks ten thousand medical men, and there are not yet four thousand for the Officers' Medical Reserve Corps. We need most doctors under thirty-five years of age to go with the troops now called out by the President. Up to the present time the larger number of volunteers have been older men. It is for the Surgeon-General's Office to decide whether you should go with the Army or remain at home. Do not decide for yourself.

Let it be the ambition of the medical profession of this country to volunteer in such numbers that a selective draft will be unnecessary.

From my intensive study of the situation in the South it is my opinion that the medical profession of the country do not realize the immediate demands of the hour. We need a large number of medical men at once to examine recruits, to care for them, and to protect them from diseases in training camps in this country; and to go with them to France.

The medical profession is really the first line of defense. The medical profession in a certain sense has been more prepared than any profession in the country. Members of our profession were the first to go to France with the American Ambulance, Base Hospital No. 4, under the command of Major Gilcreest, of the Army, and under the directorship of Dr. Crile, of Cleveland, President of the American College of Surgeons, arrived in England for duty about the same time as our torpedo destroyer fleet. Crile of Cleveland and Cushing of Harvard and the other base hospital units have set the example for all members of the medical profession to follow.

Let the medical profession listen to the voices from France and answer!

Jos. C. Bloodgood, M.D.,
Chairman Committee on Preparedness,
Southern Medical Association.

FOUR TRAINING CAMPS FOR ARMY DOCTORS TO BE ESTABLISHED BY WAR DEPARTMENT

The following announcement from the *Official Bulletin* of the United States Government of May 25 will be of interest to physicians at this time:

The creation of three new branches of the medical service of the United States Army is announced by the War Department. These branches, which have been made necessary to meet war conditions, are: A division of sanitary inspection, headed by Col. Frederick P. Reynolds; a division of hospitals and hospital construction, headed by Col. James B. Glennan; and a division of medical military instruction, headed by Col. Edward L. Munson. These three branches are co-ordinated through Col. Henry R. Birmingham.

The Army needs 5,000 doctors immediately, and by the end of the year twice that number will be required, as 10 medical officers are needed for every 1,000 men.

To meet the demand for doctors four training camps will be established for military medical instruction. Fort Riley, Kans.; Fort Benjamin Harrison, Ind.; and Fort Oglethorpe, Ga., have already been selected, and the fourth camp will be designated shortly. Training will begin at the first three camps on June 1, with 600 doctors assigned to each camp.

The doctors will be put through a course which is divided into three periods of four weeks each. This course will be designed to familiarize the men with the functions and environment of medical military work. In particular it will be necessary to teach the doctors just what training they must give the enlisted men in the Hospital Corps. Thus the first four weeks will be spent in acquainting the doctors with the duties the enlisted man is expected to perform. The second month will be devoted to training the doctors in the duties of the medical officer and in an intensive book training on military medical matters. The third month will be spent in training in the field.

In case of an emergency it will be possible to cut off the last month of training, and it may be even possible to omit the second under stress, but the first is essential, as more than 50,000 enlisted men will be needed in the Medical Corps, and it is imperative that the Army shall have sufficient doctors to train these men and supervise them in their duties.

An ambulance company and a field hospital will be established at each training camp for doctors, and later there will be special schools for the enlisted men in the Medical Department.

The first 1,800 doctors for the camp will be drawn from the medical reserve and from the militia. Doctors may join the Medical Department of the Army through application to local examining boards. These boards will be extended.

Col. Glennan's division of hospitals and hospital construction will be immediately concerned with the preparation of 32 hospitals for the divisional cantonments. Temporary wooden structures will be added to existing brick construction. It is estimated that each cantonment hospital will have a capacity of 1,000 beds. It will also be necessary to build several general and clearing hospitals and one or two receiving hospitals in seaport cities.

The division of Col. Reynolds—sanitary inspection—has to do with all sanitary matters pertaining to armies in the field, such as kitch-

ens, mess shelters, ice boxes, and all sanitary appurtenances. The work will be carried on by a corps of general sanitary inspectors, with the ranks of colonels and lieutenant colonels. A general sanitary inspector will also be attached to the commanding general of each army.

OVER TWO THOUSAND MEDICAL OFFICERS WILL BE NEEDED FOR GREATER NAVY

According to the *Official Bulletin* for May 26 the Navy Department authorizes the following:

More than 2,000 medical officers, it is estimated, will be required to care for the greater Navy, Marine Corps, Naval Reserve and coast-defense forces, the Naval Aeronautic Corps, Hospital Corps and auxiliaries, Surgeon-General Braisted announces. When all these branches of the service are recruited up to their full authorized strength the Naval Medical Corps will have to care for the health of more than 250,000 men.

Hundreds of physicians and surgeons from every part of the country have volunteered their services and a large number have been enlisted in the Medical Reserve, from which appointments are being made, after examination, to the Naval Medical Corps. Eighty-eight out of 128 who took the examination on May 12 have qualified, and 377 have been authorized to take the examination which will be held June 2.

"The increase in the Navy to 150,000 and in the Marine Corps to 30,000 will necessitate a corresponding increase in the Medical Corps," Surgeon-General Braisted said. "More than 2,000 medical officers, according to our estimates, will be required to care for the needs of the various branches of the service. There are now 394 medical officers in the Regular Naval Medical Corps, and we are taking steps to secure the large additional number necessitated by the great increase in the enlisted forces. Another examination of members of the Medical Reserve for appointment as assistant surgeons in the Regular Navy will be held at the various naval hospitals on June 2.

"Hundreds of physicians and surgeons have volunteered their services and many have been enrolled in the Medical Reserve. No profession in our country is more patriotic or self-respecting, and we feel confident of securing a sufficient number to meet our requirements.

"Two thousand hospital apprentice recruits will be needed within the next two months for the Hospital Corps, and efforts will be made to secure them as rapidly as possible. The 2,000 enlisted in the past two months are being trained at the stations at Newport, R. I.; the Great Lakes Training Station at Chicago; and at San Francisco. As rapidly as these hospital apprentices can be trained they are put into active service, making room for more recruits.

"Emergency and temporary hospital facilities are being provided at various naval training stations and wooden pavilions are being erected at Newport; Portsmouth, N. H.; Philadelphia; Norfolk; Port Royal, S. C.; Charleston; Pensacola, Fla.; New Orleans; Great Lakes, Ill.; Puget Sound, opposite Seattle; and Mare Island, Cal. This expansion, necessary to provide for the needs of the thousands of recruits in training, is being pushed rapidly to completion.

"The enormous increase in the number of enlisted men consequent upon the war makes a heavy demand upon the Naval Medical Corps, outside the professional work connected with the natural increase in the sick rate. But the individual members of the corps are performing their assigned tasks not only with energy but with enthusiasm, and every possible preparation is being made to meet any emergency which may arise and which can be foreseen."

BUY LIBERTY BONDS

"There is not a single selfish element in the cause we are fighting for * * *. The supreme test of the Nation has come. We must all speak, act, and serve together."—WOODROW WILSON, *President of the United States.*

The appropriation of $7,000,000,000.00 for conducting the war is the largest amount ever provided for any purpose in the history of the world. It is not possible for the average man, particularly a doctor, who, as a rule, does not handle money in large sums, to comprehend just what it means, but the seven billions must be raised at once.

President Wilson has wisely decreed—though the proposed increase in postal rates and the 5 % on advertising will add a burden almost too heavy for the *Journal* to bear—that most of this amount must be raised by direct taxation. A bond issue, however, of $2,000,000,000.00 has been placed on the market and Americans must show their loyalty by subscribing for the entire amount in a very short time.

These bonds will bear 3½ % interest, and since they are in denominations as low as $50.00, they will pass as currency at a premium. Already mercantile houses are advertising that they will accept bonds in payment for goods or accounts. We believe that we can speak for the medical profession in saying that physicians, and even surgeons, will accept Liberty Bonds in denominations of

from $50.00 to $100,000.00 in payment for doctors' bills. If this fact can be gotten before the public there will be a general scramble to buy bonds and the sale of the entire issue will be assured.

The medical profession, more than any other, will have to bear the burdens of this war, as it has done in other great conflicts; but doctors are not "slackers" and they can be depended upon to make every needed sacrifice, without a murmur of complaint. All can not volunteer as surgeons and many must "do their bit" in the service of their country at home. The younger men, except for unusual reasons, should enlist, but many of the older men can not. The older men, however, as a rule, are better able to buy bonds than their younger confreres, and they can thus furnish some of "the sinews of war." It is not only a patriotic duty for those who can to buy bonds, but it is a good investment.

Doctor, buy Liberty Bonds today!*

*How Liberty Bonds Are Obtained.—Blank forms of application for the purchase of these bonds can be obtained from the Treasury Department, any Federal Reserve Bank, any National, state or private bank, any express office, and any postoffice in the United States. Any bank or postmaster will aid applicant in filling out his blank and the other acts necessary to obtain these bonds.

THE PATRIOTIC DUTY OF THE MEDICAL SCHOOLS

A short while ago word was sent out warning medical schools against the premature graduation of their students and against those new graduates' shirking their subsequent hospital training. Furthermore, it has been urged that medical faculty members stick to their posts and not enter the Government services. In spite of this good advice, we learn from time to time of medical teachers who can not resist the call to the colors. As commendable as their courage and self-sacrificing motives may be, a moment's reflection will show the short-sightedness of such a course.

None of us can predict the duration of this conflict, the size of which is almost unthinkable in terms of former experiences.

The number of additional doctors needed from time to time in case the war is continued for some years to come will be enormous. Hence the wisdom of keeping intact our sources of supply in the form of medical schools and their faculties, must appeal to the reason of all thinking men.

France and England made the mistake of closing some of their medical colleges so that the instructors and students might go to the front. Later they saw the folly of such a course. Let us learn from their failures. This warning is especially applicable to the South, where the faculties are never so large as in the East.

THE PHYSICIAN'S PART IN CONSERVING THE FOOD SUPPLY

One of the great problems of the war is the food shortage that has caused almost a famine in England, France and in all Europe; and which seems to portend suffering for the want of food in our own country.

The principal danger lies in the meat shortage. The Department of Agriculture recently announced that there is available at this time 100,000,000 pounds less meat than a year ago. The wheat crop and corn crop, to a less extent, is predicted to yield much less than last year. The sugar crop is also said to be short and in many cities not more than ten pounds will be sold to one person.

Physicians, particularly those who have kept up with the recent advances in diet and nutrition, know that the average man consumes at least twice as much meats as he should and that as a result nephritis

and other degenerative diseases which are a part of arterio-sclerosis are increasing. Physicians also know that we eat much more of wheat products and of sugars and other sweets than can be assimilated. They therefore know that the average man would be more efficient and that he would live longer if he ate less of meat, flour bread and sweets, and the medical profession should give this information to the public.

If one-half the people of the United States ate no more than their nutritional needs demand there would be no shortage of meats, flour, and sugar, and we would not have the present inordinately high prices which are depriving the poor of these necessities.

The medical profession should be organized in a campaign of education that would reach every citizen of the Nation, giving each person accurate information in terms that he can understand as to just how much he should eat of the different kinds of foods. There should be a food conservation committee composed of physicians, ministers and club women in every city, town, hamlet and country district in the United States to teach the people generally that it is not only their patriotic duty to eat less, but that they will be healthier and more efficient if they will restrict their diet by about one-third. Care should be taken, however, to let the people understand that many persons are under-nourished and that every one should eat the proper amount of proteins, fats and carbohydrates to keep well and efficient.

The food problem is at this time our greatest public health question and the medical profession should rise to its opportunity in educating the public as it has done in tuberculosis, typhoid fever and other communicable diseases. If the medical profession will act quickly now it will do a wonderful part in conserving the present food supply; and we may expect from such a campaign of education that in the years to come we shall see a reduction in the mortality from nephritis, heart and arterial diseases that have been so rapidly increasing during the last thirty years.

FOOD SHORTAGE: AN APPEAL TO PHYSICIANS

In the *Journal of the American Medical Association* of May 5, page 1339, there was published a communication on a most important phase of food consumption by J. Ogden Armour, than whom there is no better informed man on the meat and wheat situation. It is true that Mr. Armour has been a speculator, but no one can question the sincerity of a man who appeals to physicians to teach the public how to live in order that the food supply may be conserved. It is evident from Mr. Armour's grasp of the present situation that he is a man of great breadth and ability. His appeal to physicians should arouse us to our opportunity for serving our country by teaching the public the truth about the amounts of the various foods needed for the normal man. Mr. Armour says:

"A food shortage without precedent confronts the United States. Unless there is a change for the better, the coming winter will see prohibitive high prices and consequent suffering from lack of food. The physicians of the United States, as guardians of the public health, are vitally interested because the health and the vitality of the people are at stake. It is in the power of the physicians to help relieve the food shortage by taking the lead in teaching people how to conserve the food supply. It must not be forgotten that conservation of the food supply is just as important and just as necessary as is increased production. Physicians can not very well increase the production of foodstuffs, but on the conservation side of the problem they can be of inestimable service to the Nation.

It is generally recognized that people eat too much. As a nation we are more inclined toward "living to eat" than toward "eating to live." The physicians, better than any others, can discourage this habit of overeating.

Knowledge of what constitutes properly balanced rations is not widespread. Housewives have not yet had opportunity to absorb the information gained through scientific study of the food problem by experts in domestic science. The result is that the American dinner table contains much that is unnecessary and often lacks things which should be there. The physicians of the land can correct this. They can spread corrective propaganda among millions of people, and they will be heeded because of the position of trust they occupy in American families.

Correct dieting on the part of American people is of paramount importance as a measure to guard against the food stringency that faces us. We must stop the waste of food by learning how to maintain our health and our strength on less than we are now consuming. In a word, we must begin eating to acquire a proper amount of nourishment instead of eating just to fill up. We must make a study of the nutrition in various foods and find out what will give the amount of nourishment we really need. When we have learned these things, our housewives can begin serving us with meals that will satisfy the appetite and provide us with plenty of nourishment without entailing any waste. With the waste eliminated, the food problem will be practically solved.

There is no doubt as to the ability of the physicians of the Nation to make themselves of prime importance in this fight to conserve the food supply. They have the necessary information and they have at their disposal the channels through which it can best be disseminated among the people of the land.

An old adage says, "Go to the busy man to get things done." Appealing to the physicians to help the food conservation movement is surely carrying out the thought in the adage. The physicians will do their "bit" for the fighting forces of the Nation. We confidently expect the medical corps to outstrip their European contemporaries in solving the surgical and medical problems of the battlefield and the camp. But it is as necessary to have food as it is to have live soldiers, even in a time of war, for without food there would soon be no live soldiers.

Therefore the "bit" that the physicians can do for their country is not limited to the service they can render to the Army on the battlefield. They can serve the Army in binding up its wounds, and they can serve the Nation by showing it how to conserve food through the intelligent use of a smaller quantity than is now being consumed.

Being familiar with the food situation, we can say that the public has not yet been sufficiently impressed either with the need for more production or with the necessity for more economical handling. This is a time when one can do things that would seem presumptuous in normal times. Under that right, we call upon the physicians of the United States to interest themselves in the food conservation campaign and to do all in their power to advise the public as to the imperative need for conserving, to the greatest possible degree, the food supply of the Nation.

By preventing waste now, we can avert hunger later on.

THE PARENTERAL ADMINISTRATION OF QUININ

The malaria season has opened in the localities that breed anopheles and where there are carriers who have harbored the gamets through the Winter. In many rural districts malaria is now and will be the prevailing disease for many months. The physicians living in those localities should be prepared to meet any emergency in the treatment of malaria, particularly when there are contraindications for giving quinin orally. It, therefore, seems timely to discuss the indications for and technic of administration by the intramuscular and intravenous methods.

Indications for circumventing the gastro-intestinal tract in the administration of quinin are:

1. Coma, convulsions, delirium.

2. Nausea, gastritis, extreme constipation and disturbances of the gastro-intestinal tract interfering with prompt absorption.

3. Abnormal gastric irritability leading to symptoms usually ascribed to idiosyncrasies, e. g., giant urticaria; also certain other evidences of intolerance.

4. Urgency, as in massive infections with impending segmentation, indicating present or impending perniciousness.

5. Doubt as to compliance with orders, usually the case with spoiled children, nervous patients and persons taking "sterilizing" treatment after symptoms have subsided.

Only two parenteral routes deserve mention, the intramuscular and the intravenous.

1. Intramuscular Method.—Note: Never inject quinin in any form or dilution into the tissues superficial to the deep fascia. Never inject it anywhere stronger than 10 % and in this strength not more than 10 grains in one place. If the patient is able to stand up, he can be made to stiffen the gluteal muscles so they can be felt. Pick

out the belly of one muscle, insert the needle (not less than 1½ inches long) vertically into it and then require the patient to relax ("balance on the other leg") and inject slowly. *Strict asepsis is understood.* If in bed, order the patient to brace his heel hard against the hand of an attendant. This also detracts attention from the puncture. Superficial cellular and fatty tissue almost always dies from the chemical effect of the quinin. Ampules of the dihydrochlorid (so-called) with or without urea containing 5 % and 6.5 % are marketed. Ten c. c. makes a convenient dose. Some criticism has been offered for putting up quinin, 10 grains in 10 c. c., on the ground that it is mixing systems. The fact is, most doctors think in grains and they buy syringes of 10 c. c. capacity.

The writer has used quinin intramuscularly in this strength for several hundred consecutive injections without getting anything worse than indurations.

Indications: Absorption from the muscular tissue is gradual. This route is therefore *not* indicated in cases of urgency, citations of authorities to the contrary notwithstanding. The special indications are for cases of the groups 2, 3, and 5. Patients can come to the office for their weekly or biweekly dose and leave a specimen of blood if desired.

On account of slower absorption, it is *the route of choice for all forms of idiosyncrasy.* Personal experience has shown that, whilst slight ringing in the ears and bitter taste are experienced almost immediately, the symptoms disappear more slowly than after a single dose of quinin by any other mode of administration.

Intravenous Method.—Experience, beginning with that of Bacelli, has shown that quinin can be safely injected in 5 % solution. The writer prefers large dilutions, 1-200, especially in pernicious forms where massing in capillary areas is the rule—in the hope of flushing these out. von Ezdorf preferred 1 % solutions. If the 10 c. c. ampules containing 10 grains are used, a small needle must be employed and the injection made as slowly as possible so as to get ample initial dilution. As a rule, the intravenous method belongs to hospital practice where facilities for diluting this solution with six-tenths per cent. salt solution are at hand. Only one salt is to be considered, the dihydrochlorid *without* urea. Dilution must always be with six-tenths per cent. salt solution and never with water, Ringer's or other mixtures.

The intravenous route should be restricted to cases of group 1 and 4. The chief disadvantage of the method is the rapid elimination ("spill") of the drug when put into the vein direct. If the parasitic groups are compact and the dose properly timed, the method becomes ideal in competent hands.

It is positively contraindicated in idiosyncrasies and hemoglobinuric fever. In the latter case one may try a test injection.

THE ARKANSAS GENERAL HOSPITAL

The Legislature of the State of Arkansas recently passed a bill, which was promptly signed by the Governor, providing $350,000.00 for the erection and maintenance of a general hospital for "the free medical and surgical treatment of the poor sick, injured and crippled in the State of Arkansas." The bill also provides for a general hospital board, consisting of the Governor, Attorney-General, and three other members to be appointed by the Governor, whose duties shall consist of selling property — from which about $150,000.00 will be derived— the selection of a site, and the building and equipment of the hospital. When these duties have been completed by the Board, the Governor shall declare it abol-

ished and the Trustees of the University of Arkansas shall immediately assume control and supervision of the hospital and its affairs under such rules and regulations as the Trustees may adopt.

It is assumed that the "Arkansas General Hospital" will be used for teaching purposes by the Medical Department of the University of Arkansas, and there can be no question of the wisdom of a hospital's being under the control of a well-equipped medical school. The greatest hospitals in the world, those in which the most thorough, scientific and humane methods of diagnosis and treatment are employed, are those connected with medical schools. It is not possible, without very great and unwarranted expense, for a charity institution to provide the necessary laboratory equipment and the staff of whole-time experts in chemistry, bacteriology, pathology and other banches required for conducting a large modern hospital.

Arkansas, in doing its duty toward its indigent sick and in providing adequate hospital facilities for its medical school, is setting an example that may be followed with profit by other states.

BOOK REVIEWS

Clinical Tuberculosis

[illegible] Marion Pottenger, A.M., M.D., LL.D., Medical Director, Pottenger Sanatorium for Diseases of the Lungs and Throat, Monrovia, Cal., Professor of Diseases of the Chest, College of Physicians and Surgeons, Medical Dept., University of Southern California, Los Angeles, Cal., and Joseph Elbert Pottenger, A.B., M.D., Assistant Medical Director, and Director of the Laboratory, Pottenger Sanatorium for Diseases of the Lungs and Throat, Monrovia, Cal. In two volumes of over seven hundred pages each; with one hundred and five text illustrations and charts, and six plates in colors. St. Louis: C. V. Mosby Co., 1917. Cloth, $12.00 for both volumes.

[illegible] deals with the pathology, pathological physiology, diagnosis and prognosis. Vol. II deals with the complications and treatment.

All branches of medicine encounter tuberculosis which is probably the most protean of diseases. The profession has therefore long needed just such a work which would give a complete and authoritative account which could be used for reference.

This is easily the most exhaustive work on tuberculosis which has come to the notice of the reviewer, since no phase of the subject as regards the lungs and throat has been neglected. The whole treatise shows the hand of the master clinician and hard student. Its splendid illustrations add greatly to the attractive make-up of the books.

Eye, Ear, Nose and Throat

[illegible] By Howard Charles Ballenger, M.D., Professor of Oto-Laryngology in the Chicago Eye, Ear, Nose and Throat College; formerly Instructor in Otology, [illegible] and Laryngology in the University of Illinois School of Medicine and Attending Oto-Laryngologist to the West Side Free Dispensary, Chicago; Oto-Laryngologist to the Chicago Graduate School of Medicine, etc., and A. G. Wippern, M.D., Attending Oculist and Aurist to St. Elizabeth Hospital, Chicago; formerly Professor of Ophthalmology and Otology, Chicago Eye, Ear, Nose and Throat College, formerly Assistant Surgeon to the Illinois [illegible] New Second Edition, Thoroughly Revised. Illustrated with 180 engravings and eight colored plates. Philadelphia and New York: Lea & Febiger, 1917. Price, $3.50.

Students and general practitioners will find this a most excellent reference hand-book. The entire field of Eye, Ear, Nose and Throat Literature has been very thoroughly abstracted and is here given "Briefly, clearly and reliably" to use the words of the authors.

The addition of anatomy of the parts is a distinct improvement over the first edition, as is also an entirely new chapter on Malformations of the external nose. If any criticism could be offered, it would be that too much stress is laid upon empirical methods of treatment. However, this does not in any way detract from the unquestioned value of the book as a manual of Eye, Ear, Nose and Throat conditions.

Materia Medica and Therapeutics, Including Pharmacy and Pharmacology

By Reynold Webb Wilcox, M.A., M.D., LL.D., D.C.L., President American College of Physicians; Professor of Medicine (Retired), N. Y. Port-Graduate Medical School and Hospital; Consulting Physician to St. Mark's, the Nassau, the Ossinning and the Eastern Long Island Hospitals, etc. Ninth Edition, Revised in accordance with the U. S. Pharmacopoeia, IX., with Index of Symptoms and Diseases. Philadelphia: P. Blakiston's Son & Co., 1917. Cloth, $3.50.

The appearance of the Ninth Edition of the U. S. Pharmacopoeia has necessitated the revision of this popular work. It has been brought well up to date and contains an [illegible] good index.

Text-Book of Ophthalmology

By Hofrat Dr. Ernst Fuchs, Professor of Ophthalmology in the University of Vienna. Authorized translation [illegible] supplied by the author and otherwise much enlarged [illegible], M.D., Surgeon Emeritus, Knapp Memorial Hospital, New York. With 462 illustrations. Fifth edition. Philadelphia and London: J. B. Lippincott Company. Cloth, $7.00.

[illegible] edition of this work appeared in 1911 and was translated and compiled by Duane, from the twelfth edition of Professor Fuchs' celebrated book.

In preparing the present edition, the translator feels a peculiar sense of responsibility since no new German edition has been issued and none is at present contemplated. However, he has, with Professor Fuchs' approval and direct co-operation, made numerous alterations and additions which will make the book more serviceable as a work of reference.

Certain sections have been entirely rewritten; not-

[illegible] paralysis.

The [illegible] therapy, the visual field, and color testing are peculiarly [illegible] coma.

The book [illegible] thorough revision and will be accorded a hearty reception by [illegible]

A Practical Treatise on Fractures and Dislocations

By [illegible], Professor of Surgery, Cornell University Medical College, New York; Consulting Surgeon, New York and Bellevue Hospitals; Corresponding Member Societe de Chirurgie, of Paris. Eighth Edition, Revised [illegible] in monotint; 946 pages. New York and Philadelphia: [illegible]

The book, which has long been an authoritative work on fractures and dislocations, has been still further strengthened in its firm position by this revision and addition. Dr. Stimson's two visits recently to the war zone enabled him to see methods put into practice and contrasted with one another on a scale more gigantic than has ever before been possible. The changes naturally consist mainly in treatment.

Diagnosis From Ocular Symptoms

By Matthias Lanckton Foster, M.D., F.A.C.S., New York, N. Y.: Rebman Company.

Unquestionably there has existed in ophthalmic literature a long felt want for a book of reference of this character and that the author has most effectively supplied that want, there can be no question in the mind of any fair-minded reviewer. The author modestly observes—The completed work "falls far short of my ideals, I can only hope that it contains suggestions which will be better developed in the future."

The author tells us in his foreword that: Ever since entering on the study of ophthalmology he has wished that some bright mind would analyse the symptoms that appertain to or appear in the eye, select certain ones for points of departure and arrange the others into syndromes, showing how those which resemble each other differ, and how exclusion is to be made. A stupendous task and yet one well worth while, if only to make a single step toward rendering accurate diagnosis easier to the unskilled. This book goes far toward accomplishing that most commendable purpose.

Diseases of the Eye

A Handbook of Ophthalmic Practice for Students and Practitioners. By George E. de Schweinitz, M.D., LL.D. Eighth Edition, reset with 386 illustrations [illegible] and [illegible] Philadelphia and London: W. B. Saunders Company, 1917.

The [illegible] will be welcomed by Ophthalmologists and general [illegible] thoroughly revised in an effort to include due reference to the importance of ophthalmic observations and therapeutic measures which have been made and recommended during the last three years.

Certain chapters and portions of chapters—notably the one on Iritis—were entirely rewritten. As in previous editions the section devoted to Skioscopy has been revised by Edward Jackson and those devoted to Corneoscleral trephining and the localization of foreign bodies, within the eye, by Lieutenant Col. El[illegible]

A number of new illustrations have been inserted and the entire work has been reset and appears in a new and greatly improved form; a valuable addition to any medical library.

THE PRACTICAL MEDICINE SERIES

Nervous and Mental Diseases—Vol. X., Series 1916. The Practical Medicine Series, Comprising Ten Volumes on the Year's Progress in Medicine and Surgery. Edited by Hugh T. Patrick, M.D., Professor of Neurology, Chicago Polyclinic; Clinical Professor of Nervous and Mental Diseases, Northwestern University Medical School, etc., and Peter Bassoe, M.D., Assistant Professor of Nervous and Mental Diseases, [illegible] with the [illegible] of Lewis J. Pollock, M.D. Chicago: The Year Book Publishers, 1917. Cloth, $1.35. Entire series of ten volumes, $10.00.

Skin and Venereal Diseases—Vol. IX., Series 1916, The Practical Medicine Series, Comprising Ten Volumes on the Year's Progress in Medicine and Surgery. Edited by Oliver S. Ormsby, M.D., Professor and Head of Dept. of Skin and Venereal Diseases, Rush Medical College, and James Herbert Mitchell, M.D., Hyde Memorial Fund Fellow and Assistant in Cutaneous Pathology, Rush Medical College, Chicago. Chicago: The Year Book Publishers, 1917. Cloth, $1.35. Series of ten volumes, $10.00.

General Medicine—Vol. I., Series 1917. The Practical Medicine Series, Comprising Ten Volumes on The Year's Progress in Medicine and Surgery. Edited by Frank Billings, M.S., M.D., Head of Medical Dept. and Dean of the Faculty, Rush Medical College, Chicago, Assisted by Burrell O. Raulston, A.B., M.D., Resident Pathologist, Presbyterian Hospital, Chicago. Chicago: The Year Book Publishers, 1917. Cloth, $1.50. Series of ten volumes, $10.00.

We have nothing but the warmest praise to offer for this very effective method of summarizing the best work that is appearing in the several branches of medicine and surgery and arranging it in condensed, readable form for the general practitioner. The resulting ten little volumes are very commendabble.

SOUTHERN MEDICAL NEWS

ALABAMA

Dr. Frank L. Thomas, Auburn, was married to Mrs. Mabel C. Wrenn on April 24.

Deaths

Dr. A. B. Stone, aged 67, died at his home in Linden on April 4.

Dr. J. R. Pou, aged 84, died at his home in Uniontown on April 13.

ARAKANSAS

At the recent meeting of the State Medical Association, held in Little Rock, the following officers were elected: President, Dr. William Brethwit, Pine Bluff; Vice-Presidents, Dr. Homer A. Stroud, Jonesboro; Edward F. Ellis, Fayetteville, and William W. York, Ashdown; Secretary, Dr. Clinton F. Meriweather, Little Rock (re-elected); Treasurer, Dr. William R. Bathurst, Little Rock. The 1918 meeting will be held at Jonesboro.

At Little Rock, the following were appointed on the State Board of Medical Examiners: Dr. O. D. Ward, England; Dr. T. J. Stout, Brinkley (both reappointed), and Dr. Hough Henry, Eagle Mills.

DISTRICT OF COLUMBIA

At Washington, the Washington Ambulance Company has been organized with Captain Ryan Devereaux, U. S. Army, in charge. The funds for equipment are being supplied by public subscription.

At Washington, on June 4, 5, 6, 7 and 8, will be held the annual meeting of the Association of Medical Officers of the Army and Navy of the Confederate States.

At Washington, the effort is being made to induce the physicians of the District to be more

(Continued on page 30)

A GOOD NAME

—be it "professional" or "trade"—
NEVER "just happens."

The sterling reputations of America's medical men, from the leaders to the rank-and-file, WERE BUILT, step by step, by hard study and harder work.

That's the way OUR name came to stand for "Quality," and we've been more than a half-century "building" it.

SHARP & DOHME

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MERCURIAL [GRAY] OIL

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A valuable adjunct in the treatment of syphilis. Syringe contains approximately ten doses. Credit of 50 cents on return of syringe. This Mercurial Oil has been accepted by the Council on Pharmacy and Chemistry. Send for pamphlet.

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National Pathological Laboratories

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(Continued from page 538)

prompt in the diagnosis and reporting of cases of tuberculosis.

FLORIDA

The Florida State Medical Association met at Atlantic Beach May 18-19. Dr. Ralph Greene, Jacksonville, was elected President; Dr. D. A. McKinnon, of Marianna, Vice-President, and Dr. Graham E. Henson was re-elected Secretary-Treasurer. Tampa was selected as the meeting place for 1918.

Dr. J. U. Porter, who has been State Health Officer of Florida for many years, has resigned, having been appointed to the rank of Colonel in the Medical Reserve Corps of the United States Army.

Deaths

Dr. John F. Cochran, aged 72, died at his home in Fort Myers on Feb. 15.

Dr. N. Sessions, aged 76, of Winona, Ind., died recently. He spent his winters in Smyrna, Fla.

GEORGIA

At Augusta, the State Medical Association held its annual meeting on April 18.

At Atlanta, a new $90,000 hospital is to be built at Fort McPherson by an appropriation of Congress.

At Augusta, at a recent meeting of the Faculty of the Medical Department of the University of Georgia, the following physicians were elected on the Board of Control of the University Hospital: Dr. Charley Crane, Dr. Harry Goodrich and Dr. W. R. Houston.

At Atlanta, the marriage of Dr. L. J. Keeling to Miss Helen Doris Harris, of Hurtsboro, was announced recently.

Deaths

Dr. R. P. Izlar, aged 50, died at his home in Waycross on April 29.

Dr. Henry McHatton, aged 51, died in Macon on April 23.

KENTUCKY

At Louisville, because of the great demand for physicians in this national emergency, the Medical Department of the University of Louisville will begin a summer school immediately after the close of the present session and will continue for eight months, at the close of which time the new senior class will be graduated.

At Louisville, seven of the University of Louisville medical graduates who have been commissioned as assistant surgeons in the Navy, have been ordered to training camp.

According to a recent decision of the Supreme Court of the State, it is not unlawful for trained nurses and other persons not holding medical licenses to administer anesthetics.

At Louisville, during the recent meeting of the State Association of Railway Surgeons, the following officers were elected for the following year: President, Dr. L. M. Scott, Jellico; Vice-Presidents, Drs. L. R. Bird, Latonia, and H. E. McKay, Bardstown; Secretary-Treasurer, Dr. H. C. Jasper, Richmond.

It has been recently reported that Dr. T. P. Satterwhite, of Louisville, is in a serious condition following a stroke of apoplexy.

LOUISIANA

At New Orleans, judging from a recent report of the City Board of Health, a great sanitary work has been carried on in that city along the lines of food inspection and rodent eradication.

Assistant Surgeon W. F. Wagenbach, who has been on plague duty in New Orleans, has been recalled and assigned to the coast guard cutter "Comanche."

Dr. Adolph Jacobs and Miss Hilda Levy, both of New Orleans, were married on April 4.

Dr. Harold J. Gondolph and Mrs. Leah K. Moore, both of New Orleans, were married on April 12.

Dr. Thomas A. Maxwell and Miss Vivian Grace, both of New Orleans, were married on April 17.

MARYLAND

At Baltimore, according to the final counting at the Allied Bazaar, $85,000 has been received.

At Baltimore, Dr. Hough Hampton Young, Director of the Brady Urological Institute, has received notification of his appointment as Major in the Medical Officers' Reserve Corps.

At Baltimore, a fund of $10,000 has been created by the Medical and Chirurgical Faculty of Maryland, the income from which will be used to purchase books for the Faculty Library and for the upkeep of Osler Hall. The fund is known as the Osler Testimonial Fund.

At Baltimore, at a meeting of the Medical and Chirurgical Faculty of Maryland, Dr. William S. Halstead was elected as President; Drs. J. E. Deets, J. McF. Dick and Julius Friedenwald, Vice-Presidents; Dr. John Staige Davis, Secretary; and Dr. W. S. Gardner, Treasurer.

Deaths

Dr. Benjamin M. Cromwell, aged 82, died at his home in Eckhart on April 30.

MISSISSIPPI

At Jackson, there will be held the next examination of applicants to practice medicine in the State. The examinations are scheduled for the 19 and 20 of June. Mississippi reciprocates with the following states: Kentucky, Virginia, West Virginia, Kansas, Maryland, Colorado, Michigan, Delaware, Nebraska, Georgia, Oklahoma, Arkansas, Indiana, Missouri, Minnesota, Nevada, Texas, Tennessee, Iowa, Wisconsin, Louisiana, New Hampshire, and the District of Columbia.

The Mississippi State Medical Association met in Jackson in May. Dr. Willis Walley, Jackson, was elected President and Dr. E. F. Howard, Secretary-Treasurer.

Deaths

Dr. J. P. Bailey died at his home in Indianola on May 7.

MISSOURI

At St. Louis, on March 30, the Society of Clinical Surgeons held a two-day session.

(Continued on page 32)

Obstinate Constipation of Infants and Young Children

is usually a dietetic affair, but is sometimes due to lack of muscular tone.

While **INTEROL** is neither a food nor a tonic, it is undoubtedly of service in these conditions because it supplies lubrication in the large bowel, facilitating both peristalsis and evacuation. Thus there is less likelihood of intestinal stasis with its resulting fermentation, putrefaction and autotoxemia.

INTEROL moves the child's bowels without the enervation, irritation griping, or after-constipation of castor oil—and is "easy to take."

INTEROL is a *particular kind* of "mineral oil," and is not "taken from the same barrels as the rest of them": (1) there is no discoloration on the H_2SO_4 test—absolute freedom from "lighter" hydrocarbons—so that there can be no renal disturbance; (2) no dark discoloration on the lead-oxide-sodium-hydroxide test—absolute freedom from sulphur compounds—so that there can be no gastro-intestinal disturbance from this source; (3) no action on litmus—absolute neutrality; (4) no odor, even when heated; (5) no taste, even when warm. Almost any child can "take" **INTEROL.**

Pint bottles, druggists. INTEROL booklet on request; also literature on "Obstinate Constipation of Infants and Young Children."

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are promptly relieved by

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Water-soluble; non-greasy; "smells nice".
Collapsible tubes at Druggists.

Samples and literature to physicians only.

K-Y Lubricating Jelly
"Stops the itch without greasing the linen."

VAN HORN and SAWTELL
15 and 17 East 40th St., New York City

"Sick Headache"

—and other headaches—

are usually relieved more or less promptly as you remove their cause. In the meantime—

K-Y ANALGESIC

locally "rubbed in," will usually afford comfort without blistering or soiling.

Gives Nature's Corrective Forces a Chance

Water-soluble. Collapsible tubes, druggists, 50c.

VAN HORN and SAWTELL
15-17 East 40th Street, New York City

(Continued from page 30)

At the recent meeting of the State Medical Association resolutions were adopted providing that any member who shall conspire with or give aid to any enemy of the United States shall automatically be dropped from membership.

Deaths

Dr. H. C. Mitchell, Kansas City, died in a local hospital on March 28.

Dr. C. L. Poynter, aged 86, died at his home in Eldridge on January 13.

Dr. I. G. W. Steedman, aged 82, died at his home in St. Louis on May 15.

Dr. Fred L. Pohlmann, St. Louis, was shot and killed in front of his office by Jacob Stenzel.

NORTH CAROLINA

The North Carolina State Medical Association, at its recent meeting in Asheville, indorsed Asheville as the meeting place of the 1918 convention of the Southern Medical Association.

At Asheville, Dr. Chas. L. Minor was recently elected President of the National Association for the Prevention and Study of Tuberculosis.

OKLAHOMA

Dr. J. W. Duke, State Superintendent of Health, met with the county superintendents recently and drew up plans for the county and city organizations to comprise units within the State system which is to become a part of the American Public Health Association.

Three ice and fuel companies of Enid have offered to furnish ice free of charge to the needy of that district and also have placed themselves ready for orders from the Red Cross.

At Pocahontas, the Randolph County Medical Association was recently organized with the following officers: President, Dr. R. R. Johnson, Holmes; Secretary, Dr. W. E. Hughes, Pocahontas; Treasurer, Dr. Carl J. Scheid, Pocahontas.

There was reported recently an outbreak of anthrax among animals in Carter County.

Dr. T. F. Harrison, Wewoka, was married to Miss Penny Williams, of the same place, on March 1.

Deaths

Dr. C. B. Clark, Ardmore, died in Fort Worth, Tex., recently.

SOUTH CAROLINA

At Greenville, in the week ending May 12, there was held a meeting of the Southeastern Sanitary Association. The officers elected were: Dr. M. M. McCord, Rome, Ga., President, and Dr. C. E. Smith, of Greenville, S. C., Secretary-Treasurer (re-elected).

At the recent meeting of the State Medical Association at Spartanburg the following officers were elected: Dr. F. H. McLeod, Florence, President; Vice-Presidents, Dr. K. M. Lynch, Charleston; Dr. Rosa L. Gannt, Spartanburg, and Dr. P. G. Ellisor, Spartanburg; Dr. E. A. Hines, Seneca, Secretary-Treasurer.

Dr. W. C. Sandy, Medical Director State Hospital for Insane, Columbia, has resigned to accept the appointment of Assistant Superintendent State Hospital for Insane, Middletown, Conn.

At McCormick, on April 11, was held the annual meeting of the Third District Medical Association. Officers elected were as follows: President, Dr. R. M. Fuller, McCormick; Vice-President, Dr. J. H. Teague, Laurens; Secretary-Treasurer, Dr. J. S. Fouche, Laurens.

Deaths

Dr. S. S. Linder, aged 62, died at his office at Union on March 31.

TENNESSEE

Deaths

Dr. B. N. Jobe, aged 66, died at the home of his son at Stewart Station on April 25.

Dr. Jos. M. Good, Williston, Fla., was buried in Cleveland on April 23.

TEXAS

At Dallas, the State Medical Association held its annual meeting on May 8, 9 and 10. Dr. S. P. Rice, Marlin, was chosen as the next President and San Antonio as the next place of meeting.

Seventeen thousand dollars was raised by the sale of Red Cross Christmas seals in Texas.

At Dallas, there was held the annual meeting of the Texas Railway Surgeons on May 7.

At Dallas, the wives of the local physicians have organized the Woman's Auxiliary of the Dallas County Medical Association.

At Leon Springs, it was reported recently that there would be opened a training camp for medical reserve officers.

At Dallas, the medical society is taking steps looking toward the changing and reorganization of the county health administration.

According to a recent order of the Board of Regents of the University of Texas, all aliens will be dismissed from the Faculty of the institution. This ruling affects Dr. James E. Thompson, Professor of Surgery, who is a British subject. The State Medical Association has petitioned the Board of Regents to qualify the order to include only enemy aliens.

Deaths

Dr. Geo. H. Moody, aged 35, of San Antonio, died at his home in that city on April 29. Dr. Moody was one of the best known neurologists in the South, and was one of the leading physicians of his State, having been President of his State Medical Association and having been honored by the medical profession in many other ways.

Dr. J. E. Lay, aged 43, died at his home in Sweet Home on April 26.

VIRGINIA

Dr. J. H. Ayres, Accoma, was recently appointed to the State Board of Medical Examiners to succeed Dr. J. N. Barney, of Fredericksburg, resigned.

At Richmond, on April 21, was announced the graduation of fifteen students of medicine who enter the Naval Reserve Corps as medical officers.

(Continued on page 34)

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A Distinct Advance in Hypodermic Asepsis

Rust-proof, germ-proof, acid-proof. Can not corrode under any conditions, climatic or otherwise. Durability practically unlimited. Sterilizable by all usual methods without injury.
One needle used for over 7,000 mercurial injections is still in perfect condition. An obvious economy.

If not obtainable of your dealer, we will send you a sample needle for $1.00, or a half dozen assorted sizes, up to one inch, for $4.50, post-paid.

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Clinical Experience Shows

That the early administration of Sherman's Bacterial Vaccines will reduce the average course of acute infections like Pneumonia, Broncho-pneumonia, Sepsis, Erysipelas, Mastoiditis, Rheumatic Fever, Colds, Bronchitis, Whooping Cough, etc., to less than one-third the usual course of such infectious diseases, with a proportionate reduction of the mortality rate.

Not opinions, but clinical facts confirm this contention.

Bacterial Vaccines are also efficient therapeutic agents in sub-acute and chronic infections.

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The Winning Bran Food

We believe that Pettijohn's holds the leading place in bran foods.

Its sales have multiplied of late. And largely because physicians endorse it, we think.

It is soft rolled wheat with bran flakes hidden in it. It meets your demand for a natural food, which everybody likes.

It complies with your preference for flake bran, the efficient form.

Pettijohn's Breakfast Food and Pettijohn's Flour supply bran foods in vast variety, and for every meal.

You will find in them exactly what you want.

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Rolled Wheat with Bran Flakes

Soft, flavory wheat rolled into luscious flakes, hiding 25 per cent of unground bran. A famous breakfast dainty.

Pettijohn's Flour is 75 per cent fine patent flour mixed with 25 per cent tender bran flakes. To be used like Graham flour in any recipe; but better, because the bran is unground.

The Quaker Oats Company
Chicago

(1502)

(Continued from page 32)

Dr. Robert E. Mitchell, Richmond, was married to Miss Julia Carlton, Toano, on April 28.

Dr. James E. McClees, Purdy, was married to Miss Kate Phillips, Richmond, on April 25.

Dr. H. G. Middlekauff, Staunton, was married to Miss Carrie Bell Sheetz, Spring Hill, on April 25.

Dr. George B. West, Norfolk, was married to Miss Esther Wheelwright, Richmond, on the 28 of April.

Dr. Martin Donelson, U. S. N., was married to Miss V. W. Dance, Danville, on April 25.

Assistant Surgeon George B. Tyler, U. S. N., formerly of Gwathmey, was married to Miss Viola Boyer, Key West, Fla., in April.

Deaths

Dr. J. D. Alderson, aged 74, died at his home in Meadow View on March 30.

Dr. J. H. Womack, aged 48, died in Danville on May 5. He was a practitioner of Chatham.

Dr. Thomas T. Arnold, aged 82, died at his home in Comorn on April 25.

Dr. John M. Habel, aged 91, died in Onancock on April 15.

WEST VIRGINIA

At White Sulphur Springs, on May 28 to 30, will be held the twenty-ninth annual meeting of the American Pediatrics Society.

Dr. M. V. Godbey, Charleston, has been appointed as Chief Medical Examiner of the West Virginia Compensation Commission to succeed Dr. J. H. McCulloch, of Charleston, who resigned recently.

Deaths

Dr. J. H. Wetzel, aged 66, Ravenwood, died in Wheeling on April 10.

Dr. J. W. Morris, aged 64, died at his home in Wheeling on March 4.

Dr. R. W. Hall, aged 72, died at his home in Moundsville on April 22.

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See article by Dr. Lloyd Noland, Southern Medical Journal, December 1916, Page 1056
Reprint of article, and descriptive circular of apparatus mailed on request

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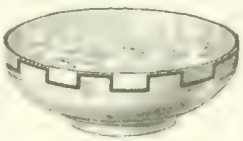

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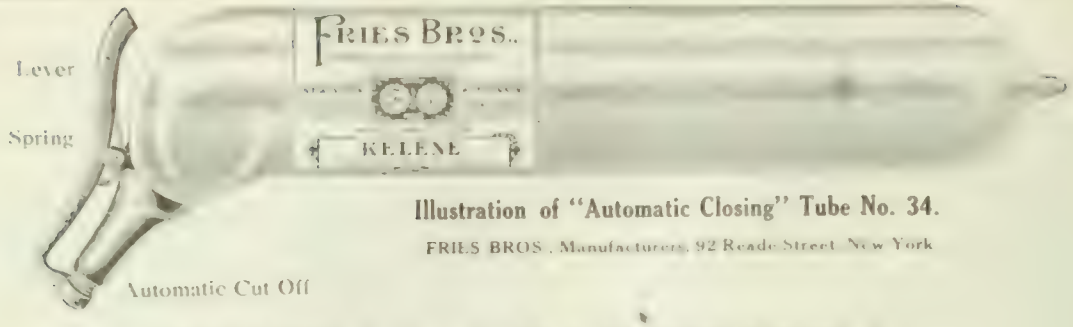

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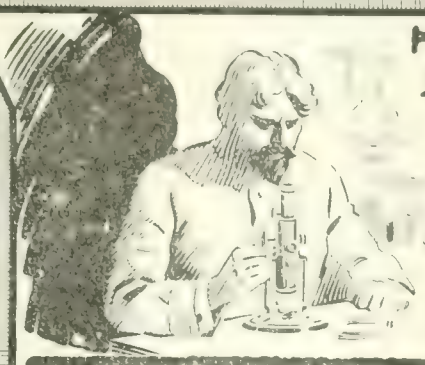

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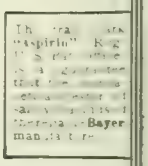

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